Dear Students and Parents:

The *High School Program of Studies* contains information to help in planning a course of study. There are a wide variety of courses and programs from which to choose. This is a time for students to take full advantage of the opportunities in high school to prepare for life after graduation and the transition to college or work.

Please take time to review the information presented in this booklet. It includes specifics about course selection options and academic levels, academic and post-secondary career planning, Virginia High School League and National Collegiate Athletic Association sports eligibility guidelines, dual enrollment agreements, graduation requirements, grade level promotion information, diploma requirements, Virginia Standards of Learning testing requirements for graduation, special Loudoun County Public Schools' programs, grade point average and senior class rank, and career clusters.

Development of a comprehensive academic and career plan is best accomplished as a collaboration between students, parents, school counselors, teachers, and principals. A well-developed plan will ensure that graduation requirements are met on time and that academic and personal growth are supported in preparation for post-secondary options such as college, vocational training, military service, or employment.

I wish you much success in your high school years.

Sincerely,

Eric Williams, Ed.D.
Superintendent
LOUDOUN COUNTY PUBLIC SCHOOLS

LOUDOUN COUNTY SCHOOL BOARD—2015–2016

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Superintendent of Schools

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LOUDOUN COUNTY HIGH SCHOOLS

BRIAR WOODS HIGH SCHOOL
22525 Belmont Ridge Road
Ashburn, Virginia 20148
Phone 703-957-4400
Edward A. Starzenski, Principal
David Royhab, Director of School Counseling

BROAD RUN HIGH SCHOOL
21670 Ashburn Road
Ashburn, Virginia 20147
Phone 571-252-2300
David A. Spag, Principal
TBD, Director of School Counseling

JOHN CHAMPE HIGH SCHOOL
41535 Sacred Mountain Street
Aldie, VA 20105
Phone 703-722-2680
John G. Gabriel, Principal
Christina Campbell, Director of School Counseling

DOMINION HIGH SCHOOL
21326 Augusta Drive
Sterling, Virginia 20164
Phone 571-434-4400
John Brewer, Principal
Jaclyn Smith, Director of School Counseling

FREEDOM HIGH SCHOOL
25450 Riding Center Drive
South Riding, Virginia 20152
Phone 703-957-4300
Douglas B. Fulton, Principal
Kenneth Christopher, Director of School Counseling

HERITAGE HIGH SCHOOL
520 Evergreen Mill Road, SE
Leesburg, Virginia 20175
Phone 571-252-2800
Jeffrey R. Adam, Principal
Suzanne Eicholtz, Director of School Counseling

LOUDOUN COUNTY HIGH SCHOOL
415 Dry Mill Road, S.W.
Leesburg, Virginia 20175
Phone 571-252-2000
Dr. Michelle L. Luttrell, Principal
Dan Croyle, Director of School Counseling

LOUDOUN VALLEY HIGH SCHOOL
340 N. Maple Avenue
Purcellville, Virginia 20132
Phone 540-751-2400
Susan A. Ross, Principal
LeeAnne Johnson, Director of School Counseling

PARK VIEW HIGH SCHOOL
400 W. Laurel Avenue
Sterling, Virginia 20164
Phone 571-434-4500
Kirk A. Dolson, Principal
Anthony Bauer, Director of School Counseling

POTOMAC FALLS HIGH SCHOOL
46400 Algonkian Parkway
Potomac Falls, Virginia 20165
Phone 571-434-3200
Dr. Elizabeth A. Noto, Principal
RaeAnn Paolozzi, Director of School Counseling

RIVERSIDE HIGH SCHOOL
19019 Upper Belmont Place
Leesburg, VA 20176
Phone 703-554-8900
Douglas A. Anderson, Principal
Robert Yarborough, Director of School Counseling

ROCK RIDGE HIGH SCHOOL
43460 Loudoun Reserve Drive
Ashburn, VA 20148
Phone 571-367-4100
John M. Duellman, Principal
Kevin Terry, Director of School Counseling

STONE BRIDGE HIGH SCHOOL
43100 Hay Road
Ashburn, Virginia 20147
Phone 571-252-2200
Matthew R. Wilburn, Principal
Tim Lucas, Director of School Counseling

TUSCARORA HIGH SCHOOL
801 N. King Street
Leesburg, Virginia 20176
Phone 571-252-1900
Pamela Paul-Jacobs, Principal
Gabrielle Carpenter, Director of School Counseling

WOODGROVE HIGH SCHOOL
36811 Allder School Road
Purcellville, Virginia 20132
Phone 540-751-2600
William S. Shipp, Principal
Geri Fiore, Director of School Counseling

OTHER SCHOOLS FOR HIGH SCHOOL STUDENTS OF LOUDOUN COUNTY

DOUGLASS SCHOOL
407 E. Market Street
Leesburg, Virginia 20176
Phone 571-252-2060
Dr. John Robinson, Principal
Juliana Baker, Mary Shepherd, Counselors

LOUDOUN ACADEMY OF SCIENCE
21326 Augusta Drive
Sterling, VA 20164
Phone 571-434-4470
George J. Wolfe, Science Academy Director
Jayne Fonash, Director of School Counseling

MONROE TECHNOLOGY CENTER AND THE LOUDOUN GOVERNOR’S CAREER AND TECHNICAL STEM ACADEMY
715 Childrens Center Road, SW
Leesburg, Virginia 20175
Phone 571-252-2080
Wagner Grier, Principal
Kim Yeager, Placement Coordinator
Michelle Trudel, Counselor

THOMAS JEFFERSON HIGH SCHOOL FOR SCIENCE AND TECHNOLOGY
6560 Braddock Road
Alexandria, Virginia 22312
Phone 703-750-8300
Evan Glazer, Principal
This educational planning guide is designed to help students and their parents:

- make informed choices about high school courses,
- realize that academic performance from kindergarten through high school relates to future goals,
- understand Virginia graduation requirements, and
- assist students in planning and refining their plans of study.

Students should study this guide and consult with their parents, school counselors, and teachers in planning their individual program of studies.
**GENERAL INFORMATION**

**SELECTING COURSES**

Every student develops an academic/career plan in the 6th grade which begins in the 7th grade.

One copy of the plan is sent to the parents for their review, and another copy is maintained by the school counseling department.

Each year students review and revise the plans as they make decisions about courses needed for the next school year, and parents have the opportunity to review and help revise the selections.

Students and their parents should carefully review the course descriptions in this booklet. Questions about the courses should be directed to counselors, teachers, or department chairpersons.

**INDIVIDUALS WHO CAN HELP WITH COURSE AND CAREER DECISIONS**

**Parents** have the greatest influence on their child’s life.

**Counselors** help by:
- providing information about courses and the decision-making process,
- explaining and counseling about graduation requirements, including Standards of Learning requirements for standard and verified units of credit,
- assisting in developing academic and career plans,
- arranging interest inventories, aptitude tests, and college admissions tests,
- interpreting standardized tests, and
- assisting in the college application process.

**Teachers** teach the skills necessary for academic and career success, can help students see their strengths and weaknesses, and can make recommendations based on them.

**Career Centers** help by scheduling speakers and providing information on:
- summer programs
- Job-for-a-Day for Juniors
- careers
- military, career, trade, and technical schools
- colleges and universities
- financial aid

**School Libraries** provide additional resources for career and college planning.

**Community Members** offer opportunities for volunteer activities and their ideas about career options and courses that have made a difference in their lives.

**COURSE SELECTION CHANGES**

Students are expected to select their courses and to adhere to their selections. In special situations, the principal may consider individual requests for changes.

Requests from students or their parents for a change in teachers cannot be allowed since such changes impact teaching loads and schedules. Consideration is given to requests from students assigned to repeat work with a teacher under whom they have previously failed. Final approval rests with the principal.

**SUBJECT LOAD**

Students in Grades 9-11 are expected to be enrolled in 7 credit subjects or their equivalent. Any variation requires the principal’s permission.

**DROPPING SUBJECTS**

A student who wishes to drop a subject may do so with the permission of the parents and principal/counselor at any time up to one week after the issuance of the report card for the course for the first marking period.

Such approved dropped courses do not appear on the scholastic record and are not calculated in the grade point average.

There is no assurance that a student who drops a course will be able to add another credit bearing course.

**COURSE CANCELLATIONS**

Any elective course that does not have sufficient enrollment in a particular school is canceled. Some courses with low enrollment may be offered in alternate years or not at all.

**ACCESS TO COURSES**

As required by federal laws and regulations, the Loudoun County School Board does not discriminate on the basis of gender, color, race, religion, handicapping conditions, or national origin in employment or in its educational programs and activities.

**SUMMER SCHOOL GRADUATION**

Students completing graduation requirements in a state-accredited summer school are eligible for diplomas. The last school attended during the regular session awards the diploma.

**ACTIVITY AND ATHLETIC PARTICIPATION**

In order to be eligible to participate in any Virginia High School League competition, a student must be currently enrolled in five subjects for credit or the equivalent, and have passed five subjects for credit or the equivalent the previous semester. If a passed course is being repeated, that course may not be counted as one of the five subjects for credit.

Students who are planning to participate in Division I and II interscholastic sports in college should see their school counselors and/or athletic directors to learn about National Collegiate Athletic Association (NCAA) regulations. These rules require certain high school courses, minimum grade point averages, and minimum college admissions testing scores before a student can be found eligible for participation.

**REPORT CARDS**

Students receive report cards four times each year. They are issued on the seventh working day for teachers after the end of each nine-week grading period.

Loudoun County Public Schools (LCPS) offers an on-line parent portal to view student assignments, assessments, resources, and grades. The parent portal is intended to open communication between teachers, students, and parents. Authorization forms requesting access are posted on each school’s website.
INCOMPLETE GRADES

Teachers may assign "Incomplete" grades in instances where the required assignments have not been submitted due to unusual but excused circumstances. In such cases, the teacher shall assign a deadline for make up of the work; however, the work must be completed by the end of the following grading period.

Incomplete grades may not be carried over from one academic year to another.

**Promotion and Credit Information**

**Promotion**

A student must have earned the minimum number of credits listed below to be promoted to the next grade.

A student’s grade level is not subject to change during the school year.

- Grade 10: 5 credits
- Grade 11: 11 credits
- Grade 12: Student must be scheduled to meet all graduation requirements by June.

**Graduation Requirements**

Students must meet the graduation requirements based on when they enter the 9th grade for the first time.

Requirements for graduation listed in this publication reflect those adopted by the Virginia Board of Education.

**Full-Year Courses**

Students receive one standard unit of credit for each full-year course successfully completed.

Students do not receive any partial credit for a full-year course. For example, a student who passes a year-long course for a semester but fails for the year or a student who does not continue that subject beyond the first semester does not receive credit for the course; rather, the student must repeat the entire course to obtain credit for it.

Credit is not awarded unless a course is listed in the Program of Studies.

**One-Semester Courses**

Students receive one-half unit of credit for each semester course successfully completed.

**Non-Credit Activities**

A student who serves as a student helper or who is scheduled for study hall, Student Cooperative Association, CAMPUS, PEER Helper program, literary magazine, or video productions does not receive a credit for that class period.

**Courses Already Passed**

Students who pass a course may repeat it for grade improvement, but a duplicate credit is not awarded. Both grades are recorded on the student’s transcript and are included when calculating grade point average and class rank.

**Credits from Middle School**

Students who complete Algebra I; Geometry; Algebra II; and/or the regular first, second, or third year of a world language in middle school earn a high school credit for courses in those subjects. Each credit counts toward graduation requirements and is included in the grade point average as well as class rank.

**Reminder To Parents of Rising 9th Graders Entering High School:**

The parent of any student who, while in middle school, took a high school credit-bearing course may elect to have the grade (and credit) omitted from the student’s transcript. If the parent elects to have such a grade omitted, written notice of such election must be given by the parent to the student’s school counselor (rising 7th and 8th graders) or to the school counseling department of the high school the student will attend (rising 9th graders), on or before August 15 of the year in which the student finishes the 8th grade. Parents of students eligible to make this election shall be provided written notice thereof and a form to be used for such election when the student receives the final report card from the middle school. (LCPS Policy 5-5.1)

**Sequential Electives**

Students seeking Standard and Modified Standard diplomas must earn at least two electives that are sequential. These must be two electives in one subject area, such as Art I and II and Applied Technology I and II. Students should talk with their school counselors for further details.
**Fine Arts or Career and Technical Education**

A fine arts or career and technical education course is any state-approved course completed in Grades 9–12 in Art, Drama, Newspaper Journalism, NJROTC, Photojournalism, Music, or Career and Technical Education (including Business, Family & Consumer Sciences, Health Occupations, Marketing, Trade and Industrial, and Technology Education).

**License and Certification Programs**

Certain programs within Career and Technical Education provide students with an opportunity for professional licensure or certification that can also count as a "student choice" verified credit toward those required for graduation.

To obtain the credit, the student must successfully complete the course sequence that prepares individuals for state licensure or certification and pass the test required by the certifying agency. Such licenses and certifications provide students a competitive edge in the workplace, offer better opportunities for earning money for college expenses, may provide increased options in military service, and help to define career pathways.

Information about substitute tests is available from the counselors or by going to [www.doe.virginia.gov](http://www.doe.virginia.gov) and clicking on "Graduation Requirements," then "Substitute Tests for Verified Credit."

**Standard and Verified Credits**

A **standard unit of credit** is earned by passing a course with a minimum of 140 clock hours of instruction.

A **verified unit of credit** is earned by passing a course and its related end-of-course Standards of Learning (SOL) test where an end-of-course test is required. Students may repeat end-of-course tests to earn the verified credits needed for graduation.

**SOL Tests**

[SOL Test] This symbol indicates that the Virginia Standards of Learning test(s) in that subject are administered a few weeks before the conclusion of the course.

SOL tests at the end of certain courses determine whether the student receives a "verified credit," a certain number of which are required for graduation. The Virginia Board of Education has approved substitute tests and required scores as alternate assessments for certain SOL tests. Detailed information is available from a counselor or by going to [www.doe.virginia.gov](http://www.doe.virginia.gov) and clicking on "Testing and Standards of Learning" and then "Graduation Requirements."

Using the SOL Blueprints, publications that outline the information measured on the SOL test for each subject, teachers address SOL test information throughout the student's education in Virginia. Scores on the SOL tests and approved substitute tests are the major factor in determining a school's accreditation status.

**Courses with End-of-Course SOL Tests:**

- Algebra I (administered at the end of Algebra I and Algebra I, Part 2)
- Algebra II
- Algebra II and Trigonometry
- Biology
- Chemistry
- Earth Science
- Geometry
- Reading (administered in English 11)
- Writing (administered in English 11)
- World History and Geography to 1500
- World History and Geography, 1500 to Present
- United States History
Diploma Changes for Students Entering 2013–2014 and Beyond:

A student must earn a Board-approved career and technical education credential to graduate with a Standard Diploma, beginning with students entering 9th grade for the first time in 2013–2014.

A student must successfully complete one virtual course, which may be non-credit bearing, to graduate with either a Standard or Advanced Studies diploma, beginning with students entering 9th grade for the first time in 2013–2014. The Modified Standard Diploma is folded into the Standard Diploma and applies to students entering 9th grade for the first time in the 2013–2014 school year. Credit accommodations will be provided for students with disabilities. Guidelines for credit accommodations will be issued by the Board of Education.

### Standard Diploma Course Requirements

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<td>Electives4</td>
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<td>Student Selected Test5</td>
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</table>

1 For students entering the 9th grade for the first time in 2003–2004 through 2010–2011: Courses completed to satisfy this requirement shall be at or above the level of algebra and shall include at least two course selections from among: Algebra I; Geometry, Algebra II, or other mathematics courses above the level of algebra and geometry. The Board may approve additional courses to satisfy this requirement.

2 For students entering the 9th grade for the first time in 2003–2004 through 2010–2011: Courses completed to satisfy this requirement shall include course selections from at least two different science disciplines: earth sciences, biology, chemistry or physics. The Board may approve additional courses to satisfy this requirement.

3 For students entering the 9th grade for the first time in 2003–2004 through 2010–2011: Courses completed to satisfy this requirement shall include course selections from at least two different science disciplines: earth sciences, biology, chemistry or physics of completion of the full sequence of science courses required for the International Baccalaureate Diploma. The Board shall approve courses to satisfy this requirement.

4 For students entering the 9th grade for the first time in 2003–2004 through 2010–2011: Courses completed to satisfy this requirement shall include at least two mathematics courses above the level of Algebra II. The Board shall approve courses to satisfy this requirement.

5 For students entering the 9th grade for the first time in 2003–2004 through 2010–2011: A student may utilize additional tests for earning verified credit in computer science, technology, career and technical education or other areas as prescribed by the Board in 8 VAC 20-131-110.

6 For students entering the 9th grade for the first time in 2011–2012 and beyond: A student may utilize additional tests for earning verified credit in computer science, technology, career and technical education, economics or other areas as prescribed by the Board in 8 VAC 20-131-110.

7 Students who complete a career and technical education program sequence and pass an examination or occupational competency assessment in a career and technical education field that confers certification or an occupational competency credential from a recognized industry, or trade or professional association or acquires a professional license in a career and technical education field from the Commonwealth of Virginia may substitute the certification, competency credential or license for (1) the student selected verified credit and (2) either a science or history and social science verified credit when the certification, license or credential confers more than one verified credit. The examination or occupational competency assessment must be approved by the Board of Education as an additional test to verify student achievement.

Electives

- Sequential Electives—Effective with the graduating class of 2003, students who wish to receive a Standard or Modified Standard Diploma must successfully complete two sequential electives. On February 5, 2002, the Board of Education approved Guidelines for Sequential Electives for the Standard and Modified Standard Diploma (PDF).
Sequential electives may be in any discipline as long as the courses are not specifically required for graduation.

Courses used to satisfy the one unit of credit in a fine arts or career and technical education course may be used to partially satisfy this requirement.

For career and technical education electives, check with the Office of Career and Technical Education at (804) 225-2051.

An exploratory course followed by an introductory course may not be used to satisfy the requirement.

An introductory course followed by another level of the same course of study may be used.

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**Advanced Studies Diploma Course Requirements**

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<tr>
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<tr>
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<td><strong>26</strong></td>
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</table>

¹ For students entering the 9th grade for the first time in 2003-2004 through 2010–2011: Courses completed to satisfy this requirement shall be at or above the level of algebra and shall include at least three different course selections from among: Algebra I, Geometry, Algebra II, or other mathematics courses above the level of Algebra II. The Board may approve additional courses to satisfy this requirement.

² For students entering the 9th grade for the first time in 2011-2012 and beyond: Courses completed to satisfy this requirement shall include at least three different course selections from among: Algebra I, Geometry, Algebra II, or other mathematics courses above the level of Algebra II. The Board shall approve courses to satisfy this requirement.

³ For students entering the 9th grade for the first time in 2003-2004 through 2010–2011: Courses completed to satisfy this requirement shall include course selections from at least three different science disciplines from among: earth sciences, biology, chemistry or physics or completion of the sequence of science courses required for the International Baccalaureate Diploma. The Board may approve additional courses to satisfy this requirement.

For students entering the 9th grade for the first time in 2011-2012 and beyond: Courses completed to satisfy this requirement shall include course selections from at least three different science disciplines from among: earth sciences, biology, chemistry, or physics or completion of the sequence of science courses required for the International Baccalaureate Diploma. The Board shall approve courses to satisfy this requirement.

For students entering the 9th grade for the first time in 2003-2004 through 2010–2011: Courses completed to satisfy this requirement shall include U.S. and Virginia History, U.S. and Virginia Government, and two courses in either world history or geography or both. The Board shall approve courses to satisfy this requirement.

For students entering the 9th grade for the first time in 2011-2012 and beyond: Courses completed to satisfy this requirement shall include U.S. and Virginia History, U.S. and Virginia Government, and

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Fine Arts and Career and Technical Education—The Standard, Advanced Studies, and Modified Standard Diplomas each contain a requirement for one standard unit of credit in Fine Arts or Career and Technical Education. The Standards of Accreditation do not require that courses used to satisfy the requirement of Fine Arts or Career and Technical Education be approved by the Board. Therefore, local school officials should use their own judgment in determining which courses students take to satisfy this requirement.

Foreign Language—The Advanced Studies Diploma contains a requirement for either three years of one foreign language or two years of two languages. In March 1998, the Board of Education approved the provision of three years of instruction in American Sign Language (ASL) for foreign language credit toward an Advanced Studies Diploma; other foreign languages will satisfy this requirement as well. Details of this action are available in: Superintendent’s Memo, Interpretive, #1, June 12, 1998.

This diploma is intended for certain students at the secondary level who have a disability and are unlikely to meet the credit requirements for a Standard Diploma. The student’s Individualized Education Plan (IEP) team and the student’s parents determine eligibility and participation at any point after the student’s 8th grade year.

Students may choose to pursue the Standard or Advanced Studies Diploma at any time throughout their high school careers.

Students must earn 20 units of credit and pass literacy and numeracy competency assessments. The following assessments may be used: 8th grade English (Reading) and mathematics Standards of Learning tests to meet the literacy and numeracy requirements. The following end-of-course tests may be used as substitutes:
- 8th grade English
- Reading/Literature and Research (administered near the end of English 11) may be substituted for the 8th grade Reading test
- 8th grade Mathematics
- Algebra I, Geometry, or Algebra II may be substituted for the 8th grade Math test

<table>
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<tr>
<th>DISCIPLINE AREA</th>
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<td>English</td>
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<td>History and Social Science</td>
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<td><strong>Total</strong></td>
<td><strong>20</strong></td>
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</table>

1 Courses completed to satisfy this requirement shall include content from among applications of algebra, geometry, personal finance and statistics in courses that have been approved by the Board.

2 Courses completed shall include content from at least two of the following: applications of earth science, biology, chemistry, or physics in courses approved by the Board.

3 Courses completed to satisfy this requirement shall include one unit of credit in U.S. and Virginia History and one unit of credit in U.S. and Virginia Government in courses approved by the Board.

4 Courses to satisfy this requirement shall include a least two sequential electives in the same manner required for the Standard Diploma.

### Electives
- **Sequential Electives**—Effective with the graduating class of 2003, students who wish to receive a Standard or Modified Standard Diploma must successfully complete two sequential electives. On February 5, 2002, the Board of Education approved Guidelines for Sequential Electives for the Standard and Modified Standard Diploma (PDF).
- Sequential electives may be in any discipline as long as the courses are not specifically required for graduation.
- Courses used to satisfy the one unit of credit in a fine arts or career and technical education course may be used to partially satisfy this requirement.
- For career and technical education electives, check with the Office of Career and Technical Education at (804) 225-2051.
- An exploratory course followed by an introductory course may not be used to satisfy the requirement.
- An introductory course followed by another level of the same course of study may be used.
- Sequential electives do not have to be taken in consecutive years.
- **Fine Arts and Career and Technical Education**—The Standard, Advanced Studies, and Modified Standard Diplomas each contain a requirement for one standard unit of credit in Fine Arts or Career and Technical Education. The Standards of Accreditation do not require that courses used to satisfy the requirement of Fine Arts or Career and Technical Education be approved by the Board. Therefore, local school officials should use their own judgment in determining which courses students take to satisfy this requirement.

### Special Diploma
Available to students with disabilities who complete the requirements of their IEP and who do not meet the requirements for other diplomas.

### Certificate of Program Completion
Available to students who complete prescribed programs of studies defined by a local school board but who do not qualify for diplomas.
Transferring into Virginia Public Schools as a High School Student

Each transfer student’s academic record is evaluated to determine the number of standard units of credits that have been earned, as well as to ascertain the remaining number of standard and verified units (see page 2) of credit that a student needs to graduate. The type of diploma a student wishes to pursue determines the total number of standard and verified credits necessary for graduation. Transfer courses which a student completed in a school division prior to enrolling in LCPS are weighted only if those courses are weighted as honors courses in LCPS. Transfer AP and IB courses may be weighted after a school review. For further details about transferring, log on to www.doe.virginia.gov and click on transfer information under “Graduation Requirements.”

Below is a summary chart of credits needed for graduation. Students should discuss the specific course requirements and course options with the counselor. “Beginning” includes the time from the first day of school until the end of the first twenty hours of instruction. “During” indicates that the student enrolled after the first twenty hours of instruction.

For Students Who Entered Grade 9 in 2003-2004 or Later

<table>
<thead>
<tr>
<th>TIME OF TRANSFER</th>
<th>REQUIRED FOR STANDARD DIPLOMA</th>
<th>REQUIRED FOR ADVANCED STUDIES DIPLOMA</th>
</tr>
</thead>
<tbody>
<tr>
<td>During 9th grade or Beginning of 10th</td>
<td>22 standard units</td>
<td>24/26 standard units</td>
</tr>
<tr>
<td></td>
<td>6 verified units:</td>
<td>9 verified units:</td>
</tr>
<tr>
<td></td>
<td>1 in Math</td>
<td>2 in Math</td>
</tr>
<tr>
<td></td>
<td>1 in Science</td>
<td>2 in Science</td>
</tr>
<tr>
<td></td>
<td>2 in English</td>
<td>2 in English</td>
</tr>
<tr>
<td></td>
<td>1 in Social Science</td>
<td>2 in Social Science</td>
</tr>
<tr>
<td></td>
<td>1 Student Selected</td>
<td>1 Student Selected</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TIME OF TRANSFER</th>
<th>REQUIRED FOR STANDARD DIPLOMA</th>
<th>REQUIRED FOR ADVANCED STUDIES DIPLOMA</th>
</tr>
</thead>
<tbody>
<tr>
<td>During 10th grade or Beginning of 11th</td>
<td>22 standard units</td>
<td>24/26 standard units</td>
</tr>
<tr>
<td></td>
<td>4 verified units:</td>
<td>6 verified units:</td>
</tr>
<tr>
<td></td>
<td>1 in Math</td>
<td>1 in Math</td>
</tr>
<tr>
<td></td>
<td>1 in Science</td>
<td>1 in Science</td>
</tr>
<tr>
<td></td>
<td>1 in English</td>
<td>2 in English</td>
</tr>
<tr>
<td></td>
<td>1 in Social Science</td>
<td>1 in Social Science</td>
</tr>
<tr>
<td></td>
<td>1 Student Selected</td>
<td>1 Student Selected</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TIME OF TRANSFER</th>
<th>REQUIRED FOR STANDARD DIPLOMA</th>
<th>REQUIRED FOR ADVANCED STUDIES DIPLOMA</th>
</tr>
</thead>
<tbody>
<tr>
<td>During 11th grade or Beginning of 12th</td>
<td>22 standard units</td>
<td>24/26 standard units</td>
</tr>
<tr>
<td></td>
<td>2 verified units:</td>
<td>4 verified units:</td>
</tr>
<tr>
<td></td>
<td>1 in English</td>
<td>1 in English</td>
</tr>
<tr>
<td></td>
<td>1 Student Selected</td>
<td>3 Student Selected</td>
</tr>
</tbody>
</table>

During 12th grade: Students should be given every opportunity to earn a diploma. Counselors work with students to examine options.


Awards for Exemplary Student Performance

Students meeting specific requirements for graduation and demonstrating exemplary performance may receive diploma seals for recognition. VDOE makes available to local school divisions the following seals:

Governor’s Seal—Awarded to students who complete the requirements for an Advanced Studies Diploma with an average grade of "B" or better, and successfully complete college-level coursework that will earn the student at least nine transferable college credits in Advanced Placement (AP), International Baccalaureate (IB), Cambridge, or dual enrollment courses.

Board of Education Seal—Awarded to students who complete the requirements for a Standard Diploma or Advanced Studies Diploma with an average grade of "A" beginning with the ninth-grade class of 2006-2007 and beyond.

Board of Education’s Career & Technical Education Seal—Awarded to students who:

- earn a Standard or Advanced Studies Diploma and complete a prescribed sequence of courses in a career and technical education concentration or specialization that they choose and maintain a “B” or better average in those courses
- OR pass an examination or an occupational competency assessment in a career and technical education concentration or specialization that confers certification or occupational competency credential from a recognized industry, trade or professional association
- OR acquire a professional license in that career and technical education field from the Commonwealth of Virginia.

The Board of Education shall approve all professional licenses and examinations used to satisfy these requirements.

Board of Education’s Advanced Mathematics & Technology Seal—Awarded to students who earn either a Standard or Advanced Studies Diploma and satisfy all of the mathematics requirements for the Advanced Studies Diploma (four units of credit including Algebra II; two verified units of credit) with a “B” average or better; and either

- pass an examination in a career and technical education field that confers certification from a recognized industry, or trade or professional association
- OR acquire a professional license in a career and technical education field from the Commonwealth of Virginia

The Board of Education shall approve all professional licenses and examinations used to satisfy these requirements.

Board of Education’s Excellence in Civics Education Seal—Awarded to students who meet each of the following four criteria:

- Satisfy the requirement to earn a Modified Standard Diploma, a Standard Diploma or an Advanced Studies Diploma
- Complete Virginia & United States History and Virginia & United States Government courses with a grade of "B" or higher
- Complete 50 hours of voluntary participation in community service or extracurricular activities, such as volunteering for a charitable or religious organization that provides services to the poor, sick or less fortunate; participating in Boy Scouts, Girl Scouts or similar youth organizations; participating in Junior Reserve Officer Training Corps (JROTC); participating in political campaigns, government internships, Boys State, Girls State or Model General Assembly; and participating in school-sponsored extracurricular activities that have a civics focus. Any student who enlists in the United States military prior to graduation will be deemed to have met this community service requirement.
- Have good attendance and no disciplinary infractions as determined by local school board policies.

**Grade Point Average and Class Rank**

- Grade point average (GPA) and class rank include all courses for which credit was earned or could have been earned in Grades 9-12. Also included are the "credit-bearing" courses (Algebra I, Parts 1 and 2; Algebra I; Geometry; Algebra II; world language) completed at the middle school level.
- When a course is repeated, both final course grades are included when calculating the GPA and rank.
- Based on their GPA, students are ranked at the beginning of the senior year and at the end of each semester of the senior year.
- If a student withdraws from a course before the end of the eleventh week of the course, the course is not recorded on the scholastic record. All grades earned are recorded on the transcript. Partial credit is not given for year-long courses dropped at the end of the first semester; however, grades earned are included in the determination of grade point average and class rank.
- If a student withdraws from a year-long course after the second week of second semester, a grade of zero is recorded for the remaining grading periods. The final grade is recorded on the scholastic record and included when calculating grade point average and class rank.
- Grades earned in Advanced Placement (AP) courses are "weighted" by adding 1.0 to the point value for the grade earned in a year-long course with the exception of a grade of "F."
- All year-long Honors (H) courses, all designated Dual Enrollment (DE) courses, and all Academy of Science (AOS) courses are "weighted" by adding 0.5 to the point value for the grade.
- To determine class rank, grade points for all courses for which a grade has been recorded are totaled and divided by the total number of courses for which a student has received a semester or year's grade.
- A student must be enrolled in a Loudoun County public school for two full semesters in order to be eligible for first and second honor graduate designation (valedictorian or salutatorian).

**Grading Scale**
Adopted at the beginning of the 2009-10 school year

<table>
<thead>
<tr>
<th>Grade</th>
<th>Numerical Equivalent</th>
<th>Points Awarded</th>
</tr>
</thead>
<tbody>
<tr>
<td>A+</td>
<td>98-100</td>
<td>4.3</td>
</tr>
<tr>
<td>A</td>
<td>93-97</td>
<td>4.0</td>
</tr>
<tr>
<td>A-</td>
<td>90-92</td>
<td>3.7</td>
</tr>
<tr>
<td>B+</td>
<td>87-89</td>
<td>3.3</td>
</tr>
<tr>
<td>B</td>
<td>83-86</td>
<td>3.0</td>
</tr>
<tr>
<td>B-</td>
<td>80-82</td>
<td>2.7</td>
</tr>
<tr>
<td>C+</td>
<td>77-79</td>
<td>2.3</td>
</tr>
<tr>
<td>C</td>
<td>73-76</td>
<td>2.0</td>
</tr>
<tr>
<td>C-</td>
<td>70-72</td>
<td>1.7</td>
</tr>
<tr>
<td>D+</td>
<td>67-69</td>
<td>1.3</td>
</tr>
<tr>
<td>D</td>
<td>63-66</td>
<td>1.0</td>
</tr>
<tr>
<td>D-</td>
<td>60-62</td>
<td>0.7</td>
</tr>
<tr>
<td>F</td>
<td>59 and below</td>
<td>0.0</td>
</tr>
</tbody>
</table>

**Recommended Testing for College-Bound Students**

**PSAT—Preliminary Scholastic Assessment Test**

- Students benefit from practice in taking the test and can identify academic strengths and weaknesses while they have time to work to improve their scores.
- Students in the 9th and 10th grades can get a “jump on college.” The test shows firsthand the kinds of reading, math, and writing skills needed to succeed in college. It also provides practice for college admissions tests.
- Students in the 11th grade can enter special scholarship competitions such as the National Merit Scholarship Qualifying Test, National Achievement Program, and National Hispanic Scholars Program.
- PSAT measures verbal and math reasoning skills and writing skills.
- This test is administered at all high schools on the national test date. The PSAT includes a writing component but does not include an essay.

**SAT Reasoning Test**

- Students in the 11th and 12th grades should take the SAT Reasoning Test which measures critical reading, mathematics, and writing skills. A student should begin taking the test by the spring of the 11th grade and may repeat the test several times.
- Most colleges use the highest critical reading, math, and writing scores obtained, even if the three sub-scores were earned on separate days. Many colleges have indicated that they plan to require applicants to present writing scores.
- The SAT tests are given several times each year at high schools in Loudoun County. Students must register about six weeks in advance of the test. Students may register on-line at [www.collegeboard.com](http://www.collegeboard.com). On-line registration allows students to learn whether space exists for testing at their preferred test center.
- Registration bulletins for the test are also available in the school counseling office, and registration forms must be mailed along with payment to the College Board.
- Free study and preparation materials are available at [www.collegeboard.com](http://www.collegeboard.com) and from the school counseling office.

**AP—Advanced Placement**

AP examinations are administered in the spring on nationally standardized dates and measure the student’s knowledge in specific subject areas.

AP courses, taught by dedicated and committed high school teachers, lay the groundwork for students to succeed on AP examinations. In LCPS, all students enrolled in AP classes are encouraged to complete the AP experience by taking the examinations near the end of the AP class.

The student’s transcript reflects the AP designation independent of the student’s election to take the AP exam. All final grades are "weighted" by 1.0 if the student passes the course.

Students who elect to take an AP exam without taking the course may have their scores sent to the colleges to which they apply; however, units of credit are awarded only to those students who complete the related AP courses.
SAT Subject Tests

Subject tests measure students’ knowledge and skills in a particular subject and their ability to apply that knowledge. Tests are offered in many subjects. Students may register on-line at www.collegeboard.com.

The test should be taken toward the end of the completion of a subject. For example, if a student is completing Chemistry in Grade 11, he/she should take the SAT Subject Test in Chemistry in the spring of the 11th grade.

Not all colleges require SAT Subject Tests; generally, the most competitive schools request these tests. Students should check test requirements with colleges in which they have interest.

Students may register for up to three tests in one day. The tests are given on the same dates as certain SAT Reasoning Tests.

“SAT Subject Test Preparation Booklet,” a free booklet, is on-line at www.collegeboard.com, and provides information about the tests and sample test questions.

ACT—American College Test

The ACT measures academic achievement in English, mathematics, reading, and science reasoning. A writing test is optional. Students should check with specific colleges to see whether the schools of interest prefer ACT or SAT and should be sure to check whether a writing test is required. Registration materials and study guides are available on line at www.act.org and in the counseling office.

Some students find it helpful to take both the ACT and SAT since colleges generally use the best scores on either test.

TOEFL—Test of English as a Foreign Language

The TOEFL measures a student’s ability to read, write, and understand English. Students who are applying to college and for whom English is a second language can demonstrate their ability to use English. Some colleges require this test for second language speakers. Some colleges will accept the SAT Subject Test in English as a Second Language instead of the TOEFL.

English Language Proficiency Test: ACCESS

ACCESS measures understanding of spoken and written standard American English and the ability to use English in the classroom and in daily life. It is designed for students who are not native speakers of English and/or whose best language is not English and/or who usually speak a language other than English at home or at work. The test concentrates on academic and practical use of English.

Special Programs

Advanced Placement

The Advanced Placement Program, often known as “AP,” is a cooperative education endeavor with the College Board. AP courses allow students the opportunity to take college-level courses while they are enrolled in high school. Students who enroll in an AP course should expect extensive reading, writing, and critical thinking which generally require additional time.

In the spring students are encouraged to take the nationally standardized AP examinations. Colleges may award academic credit and/or special placement if a student earns a qualifying score on the exam. AP final grades are “weighted” by adding 1.0 to the point value for the grade if the student passes the course.

Benefits of AP Classes

Gain the Edge in College Preparation

- Get a head start on college-level work.
- Improve writing skills and sharpen problem-solving techniques.
- Develop the study habits necessary for tackling rigorous course work.

Stand Out in the College Admissions Process

- Demonstrate maturity and readiness for college.
- Show willingness to push self academically.
- Emphasize commitment to academic excellence.

Broaden Intellectual Horizons

- Explore the world from a variety of perspectives.
- Study subjects in greater depth and detail.
- Assume the responsibility of reasoning, analyzing, and understanding for one’s self.

AVID

AVID, or Advancement via Individual Determination, is a national program targeting students in the “academic middle”—“B,” “C,” and even “D” students—who have the desire to go to college and the willingness to work hard in rigorous high school courses. AVID students enroll in honors and Advanced Placement courses and an AVID elective course. During this elective class, students learn organizational and study skills, work on building critical thinking skills, receive academic help from peers and tutors, and participate in enrichment and motivational activities. AVID students are expected to enroll in the AVID elective course each year of high school.

Classroom Driver Education

Transfer students, students who failed the Driver Education portion of Health and PE 10, or students who have taken and passed Driver Education but failed the Department of Motor Vehicles written test after passing the 36-hour course, must re-take the classroom portion of Driver Education. Students should take a state-approved Classroom Driver Education course on-line (i.e., http://www.vadriveredu.org/login/index.php). An additional requirement of classroom Driver Education for all students is a 90-minute Parent/Teen presentation, that is offered at every high school.
**Douglass School**

Douglass School, Loudoun County Public School’s (LCPS) Center for alternative education, offers the Alternative Education Program (AEP) for under-performing students, students who do not feel a part of a large traditional high school, and for students who have moved into LCPS from another school system that used an alternative schedule format. Douglass strives to create an environment in which students are able to perform to the best of their ability and that fosters respect, responsibility and cooperation. The AEP offers smaller class sizes, an alternative block schedule, an emphasis on organization and study skills, and individualized instruction to help students experience success. Douglass courses follow the LCPS curriculum including the administration of end-of-course SOL exams. Students adhere to the same behavioral expectation and complete the same requirements for promotion/graduation as do other LCPS students. Openings are limited and referrals are made through home school counselors.

**Dual Enrollment**

Students may take advantage of a program that allows them to meet the requirements for high school graduation while simultaneously earning college credits. In all cases, students must receive prior written approval by the participating high school and the college for particular courses to be taken.

Dual Enrollment icons appear throughout the Program of Studies where formal agreements exist between LCPS and colleges for dual enrollment options. Students who wish to enroll in other college courses where formal agreements do not exist should discuss options with the high school counselor.

*Note: Some dual enrollment classes taken in LCPS schools require a tuition payment.

**English Language Learners (ELL)**

Provisions are made for those students who need English as a Second Language instruction. Additional information is available from counselors. If the ELL program is located in a school other than the “home school,” transportation is provided to and from the designated sites for students.

In some situations, the student may need more than four years to complete credits needed for graduation from high school. The counselor can advise students and parents about planning the program of studies needed for graduation. Further information is available in the ELL section of the Program of Studies.

**Individualized Education**

Provisions are made for individualized education for students with identified disabilities. These include programs for students who are learning disabled, emotionally disabled, intellectually disabled, other health impaired, hearing impaired, speech impaired, visually impaired, or physically impaired. Individualized Education Plans (IEPs) specify individual accommodations.

**LCPS Academy of Science (AOS)**

The mission of the LCPS Academy of Science is to provide an academic environment where students are encouraged to develop creative scientific endeavors of their own design, while having the opportunity to pursue a rich, well-rounded high school experience.

AOS students are selected through an application process. Rising 9th grade students are invited to attend after a competitive process that evaluates test scores, academic achievements, writing samples, teacher recommendations, and self-reported interests and activities.

Student motivation and interest in science are the most valuable characteristics of AOS students.

AOS courses are “weighted” by adding 0.5 to the point value for the grade.

**Monroe Technology Center and the Loudoun Governor’s Career and Technical STEM Academy**

Students seeking highly technical and specialized instructional programs can obtain industry-level certification and/or licensure through the programs at Monroe Technology Center.

These programs allow students to pursue special interest areas and to receive industry-standard training that can lead to post-secondary educational opportunities or to a direct pathway into the workplace.

Students attend Monroe Technology Center on alternating days. Transportation is provided.

The Loudoun Governor’s Career and Technical STEM Academy is housed at Monroe Technology Center. The Academy focuses on four career clusters and five pathway initiatives that are aligned with regional and state work force demands. The four specific career cluster areas are: Agriculture, Food, and Natural Resources with a pathway in Plant Systems; Health Sciences with pathways in Diagnostic Services and Therapeutic Services; Science, Technology, Engineering, and Mathematics with a pathway in Engineering Technology; and Transportation, Distribution, and Logistics with a pathway in Facility and Mobile Equipment Maintenance.

Academy goals and performance measures include:

- Increase the number of graduates employed in high-wage, high-skilled careers.
- Increase the number of industry certifications awarded to high school students.
- Reduce the proportion of students requiring remediation in college.
- Increase the proportion of students completing a college- and workplace-ready curriculum in high school.
- Reduce drop out rates.
- Increase enrollment and retention in postsecondary education.
- Increase the proportion of students completing a college- and workplace-ready curriculum in high school.
- Increase high school graduation rates.
- Increase completion of dual enrollment college coursework.
- Provide workplace readiness experiences through strong partnerships with businesses.
- Improve academic achievement of Academy students by increasing academic rigor and relevance within selected career pathways.
Highlights of the academy program include:

- Dual enrollment opportunities are available through Northern Virginia Community College. Future dual enrollment and college credit opportunities will be discussed with other educational institution partners such as the George Washington University and Shenandoah University.
- Academy students receive enhanced science, technology, engineering, and mathematics (STEM) instruction via staff development opportunities with universities/colleges throughout the Commonwealth and curriculum enhancements. Partnerships with the Loudoun Academy of Science, as well as advisory and planning committee member participation, also support these efforts.
- The Health Science cluster pathways contain two new and innovative pathway programs. The Medical Laboratory Technology and Radiology Technology pathway programs have been developed through the support and partnership of the Claude Moore Charitable Foundation and the Inova Healthcare System. Loudoun County initiated the curriculum development within these Health Science areas in partnership with the Career and Technical Education Resource Center and the Virginia Department of Education.
- The Agriculture, Food, and Natural Resources Plant Systems pathway is aligned with the global movement to develop more green technologies and practices to conserve and protect the earth’s natural resources.
- The Transportation, Distribution, and Logistics Facility and Mobile Equipment Maintenance pathway provides direct instruction in the development and maintenance of alternative fuels and hybrid vehicles.

**On-line/Virtual Course Opportunities**

A student may apply for enrollment in selected high school credit courses if space is available with the approval of school counseling staff and the school’s Principal. An on-line form is posted on the LCPS website or parents can contact their school’s counseling office for the course application. Enrollment is subject to approval and space is limited. The completed application must be submitted to the home school’s counselor. Enrollment is contingent upon final approval from the on-line coordinator, and families will be notified.

**Scheduled Early Dismissal**

All students are to be enrolled in school for the full school day. Students enrolled in cooperative education programs may be granted an early dismissal as long as they are enrolled in five credit subjects or their equivalent.

In cases of extreme hardship, a junior or senior must obtain from the principal an application for early dismissal that is submitted to the Superintendent or his designee for approval.

**Senior Year Plus**

The Senior Year Plus initiative is designed to help better prepare highly motivated students for life after high school. While a high school diploma is a minimum credential for any career, college degrees or other career credentials mean better paying jobs. The program encourages seniors to make the most of their senior year.

Two programs comprise the Senior Year Plus Initiative:

1. **Early College Scholars**
2. **Path to Industry Certification**

The Early College Scholars program allows students to commit to earning a full semester of college credit before leaving high school. Students may earn the credits through a combination of Advanced Placement and dual enrollment courses. Students become “Early College Scholars” by meeting the qualifications and signing an agreement with their school counselor.

To qualify, a student must:

- Have a “B” or better average,
- Be pursuing an Advanced Studies Diploma,
- Be completing or have completed college-level coursework such as Advanced Placement or dual enrollment equal to at least 15 transferable college credits.

Students in the program may also register for televised and on-line Virtual Advanced Placement classes not offered by LCPS with prior approval.

Early College Scholars receive a diploma seal and certificate from the Governor recognizing their achievement. To register, students and their parents should talk with their school counselor near the end of the junior year.

The Path to Industry Certification is designed for students who plan to continue working on their high school diploma while concurrently pursuing technical training for a selected industry certification. Often this industry certification continues after high school graduation.

Typically, students continue to take industry-specific training at their local community college or Monroe Technology Center during the summer and fall after graduation. Up to one semester of technical training is available to students tuition-free in the same calendar year after high school graduation as long as that semester allows them to complete the certification program.

**Thomas Jefferson High School for Science and Technology (TJHSST)**

TJHSST students are selected on the basis of aptitude and interest in the biological, physical, mathematical, and computer science fields. Since this Governor’s School for Science and Technology is located in Northern Virginia, the school serves qualified applicants from several area school districts, including Loudoun County.

Students are selected to attend in a competitive process that evaluates admission test scores, academic achievement, personal essays, teacher recommendations, and self-reported interests and activities. Approximately 10% of the applicants are accepted. Most students enter as 9th graders. Replacements are selected for vacancies at the 10th grade level only.

**World Language Credit for English Language Learners**

Speakers of English as a second language should confer with their counselors regarding a sequence of world language study that can lead to an Advanced Studies Diploma.
Selection of Courses

All students should choose challenging classes that maximize their learning opportunities. Rigorous high school courses prepare students well for further education and successful careers.

Parents and students should consider the following when making decisions about which group to choose:

- previous performance in subject area,
- standardized test scores,
- commitment of the student, and
- recommendations from teachers, counselors, and principals.

The applicable Virginia Standards of Learning (SOL) are incorporated in all classes.

**Honors and AP**—Course content is rapidly paced with additional depth. Lessons are often designed to be complex, abstract, and open-ended.

**Academic**—Course content and expected student performance require additional reading and writing at a rigorous level.

**Grade Level**—Course content challenges students to master rigorous standards while providing individualized support.

Steps to Reading and Using the Program of Studies

1. Select a Career Cluster/Path
   - Choose a career cluster/path that closely relates to your interests, skills, values, and strengths.
   - Explore occupations that relate to your skills.
   - Learn what education, skill, and knowledge are required.

2. Decide Your Diploma Type
   - Advanced Studies
   - Standard
   - Modified Standard (for certain students entering 9th grade before 2013–14)

3. Choose Courses that Relate to Your Career Path and Diploma Choice.

Dual Enrollment Agreements

**Background of Agreements**

Loudoun County Public Schools has joined with Northern Virginia Community College (NOVA) and Shenandoah University to develop programs that allow qualified students to gain advanced standing in specific career and technical areas. Other areas of study have agreements with NOVA, Richard Bland College of William & Mary, and other colleges for dual enrollment credit. The intent of the dual enrollment agreements is to provide opportunities for advanced courses, college credit, and career ladder advancement through recognition of previous learning.

Students must demonstrate mastery of college-level skills gained through a rigorous high school program. This arrangement often means that students can enter the work force and/or pursue a college degree without loss of time or credit. Also, they avoid unnecessary duplication of effort.

The specific dual enrollments are mentioned in this booklet. Counselors and teachers in those subjects can provide information about specific requirements, credits, and application procedures. They are also available to answer questions and to discuss the programs and the opportunities the dual enrollment courses provide. Eligible students receive college credit on an official college transcript.

Dual enrollment is available for 11th and 12th grade students who meet minimum requirements on placement tests. In some cases, 10th grade students may apply for a grade level exception by meeting criteria established by the college and/or university.

Icon Beside Courses

[Images and icons for Loudoun Governor’s Career and Technical STEM Academy, James Madison University, George Mason University, NOVA, Reading University, Shenandoah University]

The icons shown above appear beside courses for which dual enrollment college credit exists and appear throughout the Program of Studies.
**Administration of Justice**  
An eligible student who completes Administration of Justice I and II at Monroe Technology Center with a “B” or better in each course can receive up to 18 credits for ADJ 100, ADJ 211, and ADJ 236 in Administration of Justice I and ADJ 212, ADJ 216 and ADJ 237 in Administration of Justice II.

**Advanced Networking**  
Students taking Advanced Networking that successfully meet the requirements of the course have the opportunity to earn 16 credit hours through Northern Virginia Community College. The course is aligned with NVCC’s ITN154, ITN155, ITN156, and ITN157 curricula. Advanced Networking uses the CISCO Certified Network Associate (CCNA) curriculum preparing students to take the CCNA certification exam.

**Auto Servicing Technology**  
An eligible student who completes Automotive Servicing I can earn 1 credit for SDV 100.

**Computer & Digital Animation**  
The qualifying student who completes Computer & Digital Animation at Monroe Technology Center with a “B” or better can receive 3 credits each for CAD 238, CAD 239, and ARC 123 for a total of 9 credits.

**Computer Integrated Engineering & Design**  
The qualifying student who successfully completes the Computer Integrated Engineering & Design Program at Monroe Technology Center will receive 3 credits EGR 115.

**Computer Systems Technology**  
The student who successfully completes the Computer Systems Technology Program at Monroe Technology Center with a “B” or better will receive 3 college credits each from NOVA in ITN 106, ITN 107, INT 101, ITE 180, and ITE 182 for a total of 15 credits.

**Emergency Medical Technician (EMT)**  
The qualifying student who successfully completes Emergency Medical Technician (EMT) at Monroe Technology Center with a “B” or better can receive 3 credits for EMS 111 Emergency Medical Technician, 3 credits for EMS 120 Emergency Medical Technician-Clinical, and 1 credit for HLT 105 CPR for a total of 7 credits.

**Environmental Plant Science**  
The qualifying student who completes Environmental Plant Sciences at Monroe Technology Center and successfully meets the requirements of the course can receive advanced placement in the two-year program Agriculture Technology program at Virginia Tech and/or receive 3 credits each from NOVA for HRT 100 Introduction to Horticulture, HRT 115 Plant Propagation, and HRT 121 Greenhouse Crop Production 1.

**Firefighter**  
The qualifying student who successfully completes Firefighter at Monroe Technology Center with a “B” or better can receive 3 credits for FST 100 Principles of Emergency Services, 3 credits for FST 111 Hazardous Material Response, and 1 credit for HLT 105 CPR for a total of 7 credits.

**Introduction to Health and Medical Sciences**  
The qualifying student who completes Introduction to Health and Medical Sciences at Monroe Technology Center with a “B” or better can receive 3 credits for HIM 111 and 1 credit for HLT 105 CPR for a total of 4 credits.

**Medical Laboratory Technology**  
The qualifying student who completes Medical Laboratory Technology I at Monroe Technology Center with a “B” or better can receive 2 credits for MDL 100.

**Radiology Technology I**  
The qualifying student who completes Radiology Technology I at Monroe Technology Center with a “B” or better can receive 2 credits for RAD 100.

**Teacher Cadet Program**  
The student who completes Teacher Cadet will receive 4 elective credits from Shenandoah University that may be transferred to any college or university.

Successful individuals in all careers should be able to work as part of a team, accept responsibility, read and understand complex information, communicate well in writing and speaking, accurately perform calculations, proficiently use computers to process information, and record and interpret data.
A Career Cluster is a grouping of occupations and broad industries based on commonalities. Career clusters include:

**Agriculture, Food & Natural Resources**
- Food Products and Processing Systems; Plant Systems; Animal Systems; Power, Structural and Technical Systems; Natural Resource Systems; Environmental Service Systems; Agribusiness Systems

**Architecture & Construction**
- Design/Pre-Construction; Construction; Maintenance/Operations

**Arts, AV Technology & Communications**
- Audio and Video Technology and Film; Printing Technology; Visual Arts; Performing Arts; Journalism and Broadcasting; Telecommunications

**Business, Management & Administration**
- General Management; Business Information Management; Human Resources Management; Operations Management; Administrative Support

**Education & Training**
- Administration and Administrative Support; Professional Support Services; Teaching/Training

**Finance**
- Securities and Investments; Business Finance; Accounting; Insurance; Banking Services

**Government & Public Administration**
- Governance; National Security; Foreign Service; Planning; Revenue and Taxation; Regulation; Public Management and Administration

**Health Science**
- Therapeutic Services; Diagnostic Services; Health Informatics; Support Services; Biotechnology Research and Development

**Hospitality & Tourism**
- Restaurants and Food/Beverage Services; Lodging; Travel and Tourism; Recreation, Amusements and Attractions

**Human Services**
- Early Childhood Development and Services; Counseling and Mental Health Services; Family and Community Services; Personal Care Services; Consumer Services

**Information Technology**
- Network Systems; Information Support and Services; Web and Digital Communications; Programming and Software Development

**Law, Public Safety, Corrections & Security**
- Correction Services; Emergency and Fire Management Services; Security and Protective Services; Law Enforcement Services; Legal Services

**Manufacturing**
- Production; Manufacturing Production Process Development; Maintenance, Installation and Repair; Quality Assurance; Logistics and Inventory Control; Health, Safety, and Environmental Assurance

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**Marketing, Sales & Service**
- Marketing Management; Professional Sales; Merchandising; Marketing Communications; Marketing Research

**Science, Technology, Engineering & Mathematics**
- Engineering and Technology; Science and Mathematics

**Transportation, Distribution, Introduction to Business & Marketing, & Logistics**
- Transportation Operations; Logistics Planning and Management Services; Warehousing and Distribution Center Operations; Facility and Mobile Equipment Maintenance; Transportation Systems/Infrastructure Planning, Management and Regulation; Health, Safety, and Environmental Management; Sales and Service

**Electives**
- Electives are subjects not required in any area of the curriculum. Students should look at the sample career paths for related high school courses.

- Students should select courses that provide them with a well-rounded education. Some courses may not be necessary in a particular career; however, the skills and information learned in those courses may provide greater understanding and appreciation and may increase one's quality of life.

- Either the Technical Specialization or two Career and Technical Education Electives in the same area would count as sequential electives.

**Career and Technical Education Specialization Courses**
- Technical Specialization Courses are those which provide students with specialized training and work force skills. Students are prepared to enter directly into the work place and to pursue further education and training after high school.

- Electives in career and technical education areas—business and information technology, family and consumer sciences, health occupations, marketing, technology education, and trade and industrial education—prepare students for technical specialization at the high school or at Monroe Technology Center.

**Economics and Personal Finance—A New Graduation Requirement for the Class of 2015 and Beyond**
- The Virginia Board of Education has added a new requirement for high school graduation. Students who enter 9th grade in 2011-2012 and beyond must successfully complete a 1-credit course in Economics and Personal Finance. In Loudoun County, students are able to fulfill this requirement between the sophomore year and the completion of the senior year. LCPS offers a 0.5-credit, semester course in Personal Finance, and a 0.5-credit, semester course in Economics. Students must complete both 0.5-credit courses before their expected graduation date.

- Alternatively, students may take a whole year of AP Economics—Micro AND Macro—to fulfill both the Economics AND Personal Finance requirements for graduation. Personal Finance standards and Economics standards are included in the instruction in AP Economics, so the whole-year course fulfills the “Economics and Personal Finance” graduation requirement.
Art I 240000
Grades 9-12 Credit: 1
Prerequisite: None

A wide variety of experiences enhance the basic foundation of art-related knowledge, skills, and ideas developed in middle school. Students explore ideas, materials, and techniques through creative and critical problem solving. Students engage in the process of art criticism and aesthetic critiques. Class discussion includes both critiques of their own pieces and the work of other artists. Students maintain a portfolio to record their progress.

The course incorporates art history, art criticism, aesthetics, and art production to include experiences with drawing, painting, sculpture, printmaking, ceramics, photography, and computer graphics. The instructor encourages students to make connections between the visual arts and other subject areas.

Art II 241000
Grades 10-12 Credit: 1
Prerequisite: Art I

Students work with more advanced techniques, media, concepts, and ideas. Focus is on the connection between studio production and personal expression. Students begin to develop and refine personal technique and style through the study of art history, art criticism, and aesthetics in relation to studio production.

Students continue to add to their portfolios. Units of study allow for more in-depth study of various media and the creative process. Units provide a balance of two- and three-dimensional experiences.

Art III 242000
Grades 11-12 Credit: 1
Prerequisite: Art II or Art I and 2 semester courses

Students enhance and refine their personal techniques and styles through the further study of art history, art criticism, and aesthetics in relation to studio production. They begin to take the initiative for generating and designing studio assignments using advanced techniques, media, and concepts.

Through the synthesis of art production, art history, art criticism, and aesthetics, students focus on the relevance of art throughout history and in their own lives. Students continue to develop their portfolios for use in demonstrating their progress and as an effective college entrance asset.

During second semester, interested art students should consult with their instructor about requirements for the AP studio art portfolio.

Art IV 243000
Grade 12 Credit: 1
Prerequisite: Art III

Art IV provides the advanced student with opportunities to initiate and design studio units of study. With the instructor's guidance and consultation, students work in a variety of media as they pursue individual creative and expressive ideas.

They continue to enhance and refine personal techniques and style through further study of art history, art criticism, and aesthetics. They also further develop their portfolios. Options for study and employment in the arts after high school are discussed. Presentations by local art professionals and visits to museums further the students' art appreciation and understanding.

Studio Art
Advanced Placement, weighted 1.0 249100
Grade 12 Credit: 1
Prerequisite: Art III

Within the Art IV class setting, motivated advanced art students may choose to complete the AP Studio Art portfolio, following AP guidelines. Developing the portfolio involves extensive additional studio time devoted to connecting critical thinking and the conceptual skills to expressive studio technique.

The portfolio requires numerous works within either drawing, 2-dimensional design, or 3-dimensional design. Also, students work with their art teacher to capture digital images of their artworks that adhere to the image submission requirements.

The portfolio is an excellent opportunity for students to develop an effective college or university, art school, or art-related employment application tool.

Students have the opportunity to take the AP Studio Art Portfolio Exam in May with the possibility of earning college credit.

Survey of Art and Architecture History I 247700
Grades 9-12 Credit: 0.5
Prerequisite: None

Students study art and architecture and their historic impact on society from prehistoric time through the Renaissance. The course leads students to a heightened awareness of and appreciation for the interaction between social, scientific, and philosophical developments in past societies and the art and architecture that these societies produced.

Students have opportunities to experience related studio activities and to use research skills as they prepare reports and presentations.

Survey of Art and Architecture History II 248700
Grades 9-12 Credit: 0.5
Prerequisite: None

Students study art and architecture from the Renaissance through the 21st century. Students compare and contrast their own culture with those cultures and societies of the past in terms of economic, social, and scientific factors.

Students experience related studio activities and use research skills as they prepare reports and presentations.
Drawing and Painting 231700
Grades 10-12  Credit: 0.5
Prerequisite: Art 1

This semester-long course allows participants an opportunity to explore drawing and painting as a method for investigating and recording the visual and imagined world. Varied media, styles, and methods are discovered as students learn to sharpen their observational skills. The drawing component encompasses an understanding of the basic elements of drawing: line, mark, tone, value, scale, and space. The painting component explores the basic elements of painting: color, shape, space, tone, value, and mark. Both drawing and painting allow students expressive and imaginative ideas to meld with the observable world. Historic and contemporary artists of diverse cultural backgrounds are presented to establish a connection with students’ own drawing and painting. Students maintain a sketchbook/journal through the semester as a record of learning and as a container for recording, imagining, and self-expression.

Photography 245700
Grades 10-12  Credit: 0.5
Photography 245600
Grades 10-12  Credit: 1
Prerequisite: Art I

The photography course is designed to serve as an introduction to black and white and digital photography. The class is offered to those students who have completed Art I, at a minimum, in order to assure that students have a background in basic design and composition. Students learn about the workings of a 35mm single lens reflex camera, the chemistry of film and print development, digital photography, and the aesthetics of quality compositional photographs. Students work in Adobe Photoshop to artistically alter and augment photos. Some history of photography is also introduced. It is desired, although not required, that students provide their own cameras.

Students may select a full-year OR one-semester course in Photography. The full-year course includes more in-depth instruction and experience.

Introduction to Business & Marketing 821000
Grades 9-11  Credit: 1
Prerequisite: None

This entry-level course is offered for all students and recommended as an introduction to the career preparation program in Business & Marketing Education. Students explore the role of business and marketing in the free enterprise system and the global economy and apply decision-making skills as consumers, employees, and citizens. Communication and interpersonal skills are developed through various activities.

Keyboarding 826000
Grades 9-12  Credit: 0.5
Prerequisite: None

This course is designed for secondary school students to develop and enhance touch skills for entering alphabetic, numeric, and symbol information on a keyboard. Students compose and produce personal, educational, and professional documents. (Students who can demonstrate touch keyboarding skills may test out and enter Advanced Keyboarding to develop document preparation skills.) This course is designed for students who have never taken a keyboarding class.

Sculpture 244700
Grades 10-12  Credit: 0.5
Prerequisite: Art I

Sculpture is designed to provide an opportunity for students to explore the fundamentals of three-dimensional design and to work with a variety of traditional and new materials. Emphasis is placed on creating works that translate personal expression as well as good sound design and studio techniques.

Students’ work is enhanced by an exploration of the contribution of major sculptors and their influences on the world of sculpture.

A minimum of Art I is required to assure that students possess background in basic design and composition.
Computer Information Systems 828001
Grades 9-12
Credit: 1
Prerequisite: Keyboarding or Keyboard Proficiency

Computer Information Systems provides students with opportunities to develop professional level skills in a project-oriented approach through the use of the Microsoft Office software package.

Students apply problem-solving skills to real-life situations through word processing, spreadsheets, databases, multimedia presentations, and integrated software activities. Students work individually and in groups to explore computer concepts, operating systems, networks, telecommunications, and emerging technologies. Students can also become eligible to test for a core level of MOS certification.

Advanced Computer Information Systems 828002
Grades 10-12
Credit: 1
Prerequisite: Computer Information Systems

Advanced Computer Information Systems provides students with basic comprehension of the Microsoft Office software package and an opportunity to refine their skills through a variety of project and research activities.

Students apply problem-solving skills to real-life situations through advanced integrated software applications, including printed, electronic, and web publications. Students work individually and in groups to explore advanced computer maintenance activities, website development, programming, networking, emerging technology, and employability skills.

Desktop/Multimedia Presentations 839001
Grades 10-12
Credit: 1
Prerequisite: Keyboarding or Keyboard proficiency

Students develop proficiency in creating desktop publications, multimedia presentations/projects, and websites using industry standard application software. Students incorporate principles of layout and design in completing publications and projects. Students design portfolios that may include business cards, newsletters, mini-pages, web pages, multimedia presentations/projects, calendars, and graphics.

Advanced Desktop/Multimedia Presentations 839002
Grades 11-12
Credit: 1
Prerequisite: Desktop/Multimedia Presentations

This course provides a project base of instruction to enhance the desktop and multimedia skills of students.

Topics covered include designing, creating, and publishing websites; complying with laws and professional ethics; relating desktop/multimedia application to business and industry standards.

Students are eligible to take a core test level of the Microsoft Office Specialist examination.

Accounting 830000
Grades 10-12
Credit: 1
Prerequisite: None

Students acquire the basic principles, concepts, and practices of the accounting cycle. Students learn fundamental accounting procedures using both manual and electronic systems.

Interpretation of accounting information is mastered through decision-making and problem-solving approaches that include source documents, case studies, and simulations. Course topics include forms of ownership, accounts receivable/accounts payable systems, payroll, taxes, banking activities, business ethics, and financial statements.

Advanced Accounting 831000
Grades 11-12
Credit: 1
Prerequisite: Accounting

Students gain knowledge of advanced accounting principles, procedures, and techniques used to solve business problems and to make financial decisions. Students use accounting and spreadsheet software to analyze, synthesize, evaluate, and interpret business financial data. Students work in a technology-integrated environment using authentic workplace industry scenarios that reflect current industry trends and standards. Upon completion, students should be able to demonstrate an understanding of the principles of decision-making, problem-solving, and critical thinking, and apply them to both personal and business financial situations.

Leadership Development 820700
Grades 9-12
Credit: 0.5

This course is designed to equip students with personal and group leadership skills. Course content includes units in principles of leadership, parliamentary law, speaking in public, developing effective communications and human relations skills, and developing positive public relations.

School and community leadership opportunities are used to provide practical application of the course content.

Business Law 835700
Grades 10-12
Credit: 0.5
Prerequisite: None

Students examine the foundations of the American legal system and learn the rights and responsibilities of citizens. Students gain practical knowledge and life skills by exploring economic and social concepts related to laws governing business and individuals. Focus areas include contracts, consumer protection, criminal law, tort law, international law, family/domestic law, employment law, and careers in the legal profession.

Business Management 836700
Grades 10-12
Credit: 0.5
Prerequisite: None

Students study basic management concepts and leadership styles as they explore business ownership, planning, operations, marketing, finance, economics, communications, the global marketplace, and human relations. Quality concepts, project management, problem solving, and ethical decision-making are an integral part of the course. Student leadership skills may be enhanced by participation in school-based job shadowing, internships, and/or the Future Business Leaders of America (FBLA).
English high school courses provide instruction in oral language, reading and literature, writing and grammar, research, and vocabulary. Students practice whole-class and independent reading, and teachers provide skills for reading fiction and nonfiction. Students compose both literary analysis essays and essays for other purposes, informational writing, and timed writing. They also master a range of grammar and usage skills. Research instruction emphasizes the ability to analyze, synthesize, and evaluate information from a variety of sources, and it requires students to produce formal research papers. Vocabulary instruction in all grades not only prepares students for PSAT, SAT, ACT, and SOL tests, it helps to develop students’ reading comprehension and their ability to express themselves orally and in writing. Teachers focus on the use of context clues to understand unfamiliar words; distinctions between denotation and connotation; and a study of synonyms, antonyms, and homophones.

Academic courses challenge students to master rigorous standards while providing individualized support. Honors courses are offered in Grades 9, 10, and 11. While they focus on the same skills as grade level and academic courses, honors courses are distinguished by a more rigorous and inquiry-based study of literature and nonfiction texts. All students in an English honors course create a reflective portfolio that shows evidence of the growth in their analysis and written communication skills. All year-long honors courses receive a weight of 0.5. They move at an accelerated pace, cover a greater breadth and depth of textual study, and require more independent work.

Specific grade level distinctions are described below.

English 9
Academic
Honors, weighted 0.5
Prerequisite: English 8

In Grade 9 oral language instruction emphasizes dramatic reading of literary selections and planned oral presentations. The reading and literature component focuses on a study of fiction and nonfiction genres. Writing instruction develops skills in narrative, expository, and informational writing. Direct vocabulary instruction improves students’ reading and writing fluency and prepares them for the SOL, SAT, and ACT tests. Students produce documented research papers, using print, electronic databases, and on-line sources.

English 10
Academic
Honors, weighted 0.5
Prerequisite: English 9
Credit: 1

In Grade 10 oral language instruction emphasizes the participation in and the critique of small group learning activities. The reading and literature component includes a survey of British literature, especially the reading of poetry and drama; nonfiction reading focuses on the understanding and evaluation of consumer information such as labels, warranties, and contracts. Writing instruction pinpoints expository composition and the ability to critique professional and peer writing. Direct vocabulary instruction improves students’ reading and writing fluency and prepares them for the SOL, SAT, and ACT tests. Students are taught to collect, organize, and present information in a documented research paper.

English 11
Academic
Honors, weighted 0.5
Prerequisite: English 10
Credit: 1

2 SOL Tests In Grade 11 oral language instruction emphasizes the ability to give and to critique informative and persuasive presentations. The reading and literature component focuses on a survey of American literature and the ability to read and comprehend various kinds of manuals, business letters, newspapers, brochures, reports, catalogs, journals, speeches, biographies, and autobiographies. Writing instruction focuses on the ability to write persuasively, as well as personal, professional, and informational correspondence. Direct vocabulary instruction improves students’ reading and writing fluency and prepares them for the SOL, SAT, and ACT tests. In addition to research papers, students produce multi-media research reports.

English Language and Composition
Advanced Placement, weighted 1.0
Grade 11
Prerequisite: English 10
Credit: 1

SOL Test AP Language and Composition is recommended for students who want a challenging course that emphasizes the analysis of nonfiction. Students read a variety of works from several genres, time periods, and cultures, including a focus on texts by American authors. Varied and frequent composition assignments require close reading, rhetorical analysis, exposition of ideas, and the understanding of particular rhetorical forms and terms.

Students have the opportunity to take the AP Language and Composition Exam in May with the possibility of earning college credit. (SOL Test for 11th grade only.)
English 12  
Academic  
Prerequisite: English 11  
Credit: 1

This course is divided into two distinct semesters of study, one focusing on a study of world literature and the other on writing.

Students read representative literature from many cultures, countries, and time periods to increase their understanding of literature and the people who produced it. Activities in this semester include oral and written analyses of readings, overviews of the society and history that relate to a particular selection, and evaluations of authors’ styles and themes.

In the other semester, students receive extensive writing practice in the expository, narrative, descriptive, and persuasive forms. The semester course begins with a review of elements of style and a study of paragraph development to prepare students for more extensive assignments that follow. Students practice composing skills through the writing of critical and creative essays, description, narrative, persuasion, and exposition.

English 12—Dual Enrollment, weighted 0.5  
Prerequisite: English 11  
Credit: 1

LCPS provides students the opportunity to earn college credit while fulfilling their English 12 course requirement. English 12 Dual Enrollment is a rigorous, college-level course that focuses on composition, argumentation, and critical reading skills. It is a fast-paced course that covers not only the Virginia English 12 SOL, but also two full semesters of college-level composition and reading. English 12 DE is taught by LCPS teachers who are also adjunct faculty members at participating colleges. Upon successful completion of this full-year course, students will receive 6 college credits. The student’s grades and credits will appear on the student’s official college transcript. If a student earns a grade of C or better, those credits may be transferred to any four-year Virginia college or university. Many out-of-state institutions may also accept the credits. In some instances, students must pay a discounted tuition to the sponsoring college.

English Literature and Composition  
Advanced Placement, weighted 1.0  
Prerequisite: English 11  
Credit: 1

AP Literature and Composition is recommended for students who want a challenging course that emphasizes the study and practice of writing and the analysis of literature (prose, fiction, poetry, and drama). Students read a variety of works from several genres and cultures. Varied and frequent composition assignments require close reading, literary analysis, exposition of ideas, and the understanding of particular literary forms and terms.

Students have the opportunity to take the AP Literature and Composition Exam in May with the possibility of earning college credit.

Creative Writing  
Prerequisite: None

Creative Writing is a one-semester English elective that provides a supportive environment in which students write prose, poetry, and drama and read examples of various genres. This course focuses on the study of the fundamental elements of creative writing, including developing strategies for writing creatively, practicing aspects of narrative writing, using poetic devices, and developing voice. Students maintain a writing portfolio, collaborate to critique and improve their work for final review, and seek opportunities for publishing their writing.

Fundamentals of Writing  
Prerequisite: None

Fundamentals of Writing is a writing refresher course for writers of all ability levels who would like to develop their skills. This one-semester course provides a supportive environment in which students engage in various activities to improve their writing skills, particularly for expository and technical writing. This course focuses on the study of the fundamental elements of writing, including strategies for writing and aspects of nonfiction writing. Students maintain a writing portfolio and collaborate to critique and improve their work for final review.

Etymology  
Prerequisite: None

Etymology is the study of language families, root words, prefixes, suffixes, semantic changes, and word elements. Students study the meanings and derivations of English words to broaden their knowledge and command of the English language. This course is particularly useful for students preparing to take the SAT and ACT.
21st Century Literacy Strategies I 192000
Grades 9-12 Credit: 1 per year
This course is designed for students who will benefit from specific instruction in reading secondary content material and strengthening reading and writing skills and strategies. Instruction supports literacy development with instruction in skills related to the alphabetic principle, fluency, vocabulary, reading comprehension, writing, viewing, critical thinking, and preparation for SOL exams. Teaching strategies increase motivation by making reading relevant to students’ lives.

21st Century Literacy Strategies II 193000
Grades 10-12 Credit: 1 per year
This course is a continuation of 21st Century Literacy Strategies I. Instruction builds upon students’ reading and writing competencies and support students' efforts to analyze, compare, evaluate, and interpret information from a variety of disciplines including texts, visual representations, and media.

Theater Arts I 250000
Grades 9-12 Credit: 1
Students survey the technical and performing art of theater. They are exposed to the major elements of theater and gain knowledge of its principles through study and practice in both performance and production. Representative units of study include improvisation, mime, basic acting, the history of the theater, stage settings, costuming, make-up, and lighting.

Theater Arts II 251000
Grades 10-12 Credit: 1
More than a continuation of Theater Arts I, Theater Arts II is an in-depth study of areas covered only briefly in the first year and an introduction to new areas. The basic course is built on a cluster of required units that stress direction, design, and acting.

Theater Arts III 252000
Grades 11-12 Credit: 1
Designed for students with high interest and motivation for study in the theater arts while increasing their understanding of the entire realm of theater, the course provides the students with the opportunity to put theory into practice through major projects in directing, acting, and design.

Theater Arts IV 253000
Grade 12 Credit: 1
Prerequisite: Theater Arts III
This course is an exploration of the duties of stage technicians and their contribution to the total aesthetic effect of a dramatic production. Topics covered include design research and principles; scene shop organization; painting and construction techniques; equipment use and maintenance; principles and application of sound, lighting and computer technology; the use of special effects; costume and make-up considerations and selection; publicity and business management; theater safety; and the function of technical stage personnel in production work. Technical theater incorporates academic study and hands-on application of knowledge and skills.

Technical Theater I 254000
Grades 9-12 Credit: 1
Prerequisite: None
The course is an exploration of the duties of stage technicians and their contribution to the total aesthetic effect of a dramatic production. Topics covered include design research and principles; scene shop organization; painting and construction techniques; equipment use and maintenance; principles and application of sound, lighting and computer technology; the use of special effects; costume and make-up considerations and selection; publicity and business management; theater safety; and the function of technical stage personnel in production work. Technical theater incorporates academic study and hands-on application of knowledge and skills.

Technical Theater II 255000
Grades 10-12 Credit: 1
Prerequisite: Technical Theater I
This course can be retaken for credit.
Similar to Technical Theater I, the course involves additional exploration of the duties of stage technicians and their contribution to the total aesthetic effect of a dramatic production. Topics covered include a review of basic design research and principles; leadership roles in scene shop supervision; a review of principles and application of sound, lighting, and computer technology with an emphasis on sound and lighting design principles; a survey of theater safety from the perspective of students’ increased roles as supervisors in scene work activity; and major technical stage positions in production work. Technical Theater II incorporates additional research and academic study and hands-on application of knowledge and skills. Technical II students also complete an additional unit of Design/Technical Portfolio in preparation for college admission requirements. Students may retake Technical Theater II for credit, specializing in an area of study and revising their design/technical portfolios to reflect their growing expertise in their specialization.
Journalism 187000
Grades 9-12 Credit: 1
Prerequisite: None
This year-long elective introduces students to many facets of newspaper and mass media: production, history, and writing. Students learn to use a variety of journalism skills to write in journalistic style, recognize the role of mass communication in modern society, and understand the First Amendment. Students selecting this course should have strong writing skills or should have an interest in developing their writing skills.
This course is designed to prepare students to serve on the newspaper staff (Newspaper Journalism I) or the yearbook staff (Photojournalism I).

Newspaper Journalism I 188000
Grades 10-12 Credit: 1
Prerequisite: Journalism and/or Instructor’s Approval
Students learn the basics of newspaper production while serving as staff writers for the school newspaper.
Units of study include school press law and ethics, layout and design, basic photography, basic publication technology, journalistic research, interviewing, plant preparation, and advertising.
Students are introduced to publication software.

Newspaper Journalism II 188002
Grades 11-12 Credit: 1
Prerequisite: Newspaper Journalism I
Students serve as staff writers and page editors for the school newspaper.
Units of study expand upon those introduced in Newspaper Journalism I and add on-line publication, polls and statistics, and newspaper evaluation.
Students use publication software to produce the school newspaper.

Newspaper Journalism III 188003
Grade 12 Credit: 1
Prerequisite: Newspaper Journalism II
Students serve as editors for the school newspaper.
Units of study expand upon those introduced in Newspaper Journalism I and II and add software and on-line services, press law, photo management, and video interviewing.
Students use publication software to produce the school newspaper.

Photojournalism I 189001
Grades 10-12 Credit: 1
Prerequisite: Journalism and/or Instructor’s Approval
Students learn the basics of yearbook production while serving as staff members for the school yearbook.
Units of study include school press law and ethics, layout and design, basic photography, basic publication technology, journalistic research, interviewing, unifying concept, plant preparation, and advertising.
Students are introduced to publication software.

Photojournalism II 189002
Grades 11-12 Credit: 1
Prerequisite: Photojournalism I
Students serve as staff members and page editors for the school yearbook.
Units of study expand upon those introduced in Photojournalism I and add inclusion, accuracy, and fairness; polls and statistics; and yearbook management.
Students use publication software to produce the school yearbook.

Photojournalism III 189003
Grade 12 Credit: 1
Prerequisite: Photojournalism II
Students serve as editors for the school yearbook.
Units of study expand upon those introduced in Photojournalism I and II and add press law, yearbook evaluation, video interviewing, and public relations.
Students use publication software to produce the school yearbook.

Public Speaking 194700
Grades 10-12 Credit: 0.5
Prerequisite: None
Students explore the process of generating, transmitting, receiving, and evaluating ideas and feelings through intrapersonal and interpersonal communication, oral interpretation, group discussion, and public speaking. This course cultivates personal growth and development, develops oral communication skills, and promotes the application of oral communication skills to other academic disciplines and to life experiences.
ELL Literacy 1  190011
Grades 9-12  Elective Credit: 1

In this course, Proficiency Level 1 ELL students will develop their literacy skills through a variety of reading and writing activities. Students will learn strategies to support their development as active and critical readers and will explore a variety of text types, including both fiction and nonfiction. Students will also create original compositions of varying lengths, styles, and types to support their growth as writers in core content and elective study areas.

ELL Literacy 2  190012
Grades 9-12  Elective Credit: 1

In this course, Proficiency Level 2 ELL students will expand their literacy skills in order to become more mature readers and better writers. Students will apply a variety of reading strategies as they become more active and critical readers of increasingly challenging fiction and nonfiction texts. Students will also create original compositions of varying lengths, styles, and types as they expand their skills as writers.

English as a World Language I (EWL I)  394010
Grades 9-12  World Language Credit: 1

In this course, Proficiency Level 1 ELL students learn English vocabulary, grammar, and sentence structure to assist them in the development of academic, cultural, and life skills. All four language domains (listening, speaking, reading, and writing) are incorporated in order to support students’ acquisition of academic English.

English as a World Language II (EWL II)  395010
Grades 9-12  World Language Credit: 1

In this course, Proficiency Level 2 ELL students learn to expand their communication skills in the four language domains (listening, speaking, reading, and writing). Complex vocabulary, grammatical, and sentence structures are used to extend students’ development of academic English.

Advanced English Language Learners (ADV ELL)  197010
Grades 9-12  English Credit: 1

In this course, Proficiency Level 3 ELL students engage in the four language domains (listening, speaking, reading, and writing) around a variety of topics and themes as they refine their academic English. This course must be taught by a teacher with VA licensure in 9-12 English.

Newcomer ELL Mathematics Concepts
(Formerly ELL Math)  588010
Grades 9-12  Elective Credit: 1
(not a math credit)

In this course, Newcomer ELL students (Proficiency Levels 1-2) learn the language of mathematics along with key concepts of the grade-level mathematics curricula of Algebra I and Geometry. The Newcomer ELL Math Concepts course can be taken concurrently with a grade-level mathematics course to provide additional support for ELLs. This course is most appropriate for a students at a low levels of English proficiency who possess limited background in mathematics and/or have had limited or interrupted prior schooling.

Newcomer ELL Science Concepts
(Formerly ELL Science Concepts 1)  650310
Grades 9-12  Elective Credit: 1
(not a science credit)

In this course, Newcomer ELL students (Proficiency Levels 1-2) learn the language of science along with key concepts of the grade-level science curricula, including general science theory, earth science, and biology. The Newcomer ELL Science Concepts course can be taken concurrently with a grade-level science course to provide additional support for ELLs. This course is most appropriate for a students at a low levels of English proficiency who possess limited background in science and/or have had limited or interrupted prior schooling.

Newcomer ELL Social Science Concepts
(Formerly ELL Social Studies Concepts 1)  770010
Grades 9-12  Elective Credit: 1
(not a social science credit)

In this course, Newcomer ELL students (Proficiency Level 1) learn the language of social science along with key concepts of
the grade-level social science curricula, including World History and United States and Virginia History. The ELL Social Science Concepts course can be taken concurrently with a grade-level social science course to provide additional support for ELLs. This course is most appropriate for students at a low levels of English proficiency who possess limited background in social science and/or have had limited or interrupted prior schooling.

**FAMILY & CONSUMER SCIENCES**

**Choices**

<table>
<thead>
<tr>
<th>Course Title</th>
<th>Code</th>
<th>Credit</th>
<th>Prerequisite</th>
<th>Recommended</th>
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</thead>
<tbody>
<tr>
<td>Early Childhood Education I</td>
<td>844001</td>
<td>1</td>
<td>None</td>
<td>Human Development</td>
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<tr>
<td>Grades 10-12</td>
<td></td>
<td></td>
<td></td>
<td>BWHS, BRHS, DWS, FHS, HHS, JCHS, PVHS, PFHS, SBHS, THS, and WHS only</td>
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<tr>
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<tr>
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<tr>
<td><strong>Grades 9-12</strong></td>
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<tr>
<td><strong>Grades 9-10</strong></td>
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</tbody>
</table>

Teenagers are often faced with making tough decisions that can have lifetime effects. Through the application of critical thinking skills, reasoning skills, and problem solving abilities, students develop the skills to make decisions and accept and handle the responsibilities of those decisions.

Choices investigates timely issues such as group and family dynamics, establishing friendships, positive peer pressures, conflict resolution, dating relationships, human reproduction, stress and time management as well as dealing with the pressures of grades, working and going to school, drugs and alcohol, body perceptions and eating disorders, and negative peer pressure.

Early Childhood Education I

This program focuses on the integration of knowledge, skills, and practices required for careers in early childhood education. Content covers career paths within early childhood, education, and services; developmentally-appropriate practices; integration of the curriculum and instruction to meet children’s developmental needs and interests; healthy and safe learning environments; principles of guiding children; teaching methods and strategies; and arranging learning centers that provide for exploration, discovery, and development.

Students gain practical experience in the early childhood facility at their high school, an elementary school, or a community childcare facility.

Proof of tuberculosis (TB) testing is required. Students are responsible for getting TB testing prior to the start of the school year.

Independent Living

Whether students choose to enter the work force or to continue their education after high school, they must acquire the life skills necessary to make the transition to independent living. Students become empowered to make responsible consumer choices by applying decision making, problem solving, and management processes; to see themselves in the roles of making and managing money; to calculate value for food, clothing, and housing dollars; and to apply the resources of time, materials, and technology for successful living.
**Introduction to Housing & Interior Design**

*Grades 9-12  
Credit: 0.5  
Prerequisite: None*

Students learn to evaluate and create plans for a pleasant living environment using their creativity, talent, and self-expression.

Housing selection; development of floor plans; design of various living areas; the selection and construction of home furnishings, equipment, and accessories; and interior decorating fundamentals are covered.

Students learn to use the computer to design the exterior and interior of a house as well as landscape design. Individual design projects may be required for which the students must provide materials.

**Leadership Development**

*Grades 9-12  
Credit: 0.5  
Prerequisite: None  
Credit of 0.5 or 1 varies by school*

This course is designed to equip students with personal and group leadership skills. Course content includes units in principles of leadership; parliamentary law; speaking in public; developing effective communications and human relations skills; and developing positive public relations.

School and community leadership opportunities are used to provide practical application of the course content.

**Marriage & Family Dynamics**

*Grades 11-12  
Credit: 0.5  
Prerequisite: None*

Creating and sustaining a lasting marriage begins with the study of self and relationships with others. The institution of marriage is examined and includes topics such as mate selection, commitment, communication, role expectations, financial stability, careers, and parenthood. The curriculum also addresses family dynamics, balancing work and family life, building strong family units, and solving personal and family problems.

**Teacher Cadet Program, weighted 0.5**

*Grades 12  
Credit: 1  
Prerequisite: 3.0 GPA, three teacher recommendations, a student essay, and an application process*

The Teacher Cadet Program is designed to attract talented high school students into the teaching profession through a challenging introduction to teaching.

The program seeks to provide these students insight into the nature of teaching, the problems of schooling, and the critical issues affecting the quality of education in America’s schools.

Students participate in field experiences in LCPS Grades K-12. Students work with classroom teachers at their chosen grade level of interest.

Proof of tuberculosis (TB) testing is required. Students are responsible for getting TB testing prior to the start of the school year.

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**Health and Physical Education**

**Health and Physical Education 9 (PE)**

*Grade 9  
Credit: 1  
Prerequisite: None*

Students are offered a variety of challenging activities with an emphasis on incorporating the five components of fitness into a fitness plan. High School Health and Physical Education is scheduled for one block every other day. Students begin to develop personal choices for preferred activities that include cooperative games, individual and dual sports, team sports, rhythmic activities, physical fitness testing, and lifetime fitness and recreational activities.

The 9th grade health curriculum includes topics such as personal fitness and nutrition; stress and mental health; risk behaviors; consumer health and health agencies; global health issues; certification training in Cardio-Pulmonary Resuscitation (CPR), Automatic External Defibrillation (AED) and First Aid; community health; and the use of technology in making informed, healthy choices. Selected Family Life Education (FLE) topics are also included in this course.

**Health and Physical Education 10**

*Grade 10  
Credit: 1  
Prerequisite: Health and PE 9*

Students are offered a variety of challenging activities with an emphasis on incorporating the five components of fitness into a fitness plan. High School Health and Physical Education is scheduled for one block every other day. At this level students select preferred activities from a menu of activities, including cooperative games, individual and dual sports, team sports, rhythmic activities, and lifetime fitness and recreational activities. Physical fitness testing is also included in this course.

The 10th grade health curriculum includes topics such as alcohol, tobacco, and other drugs; organ donation; nutrition and wellness planning; risk behaviors; emotional health; peer pressure; and conflict resolution. Driver Education classroom instruction and selected Family Life Education (FLE) topics are also included in this course.

**Classroom Driver Education**

*Grade 10  
Credit: 0  
Prerequisite: Health and PE 9*

This course consists of 36 hours of classroom instruction and the 90 minute Partners for Safe Teen Driving presentation. Classroom Driver Education includes topics such as motor vehicle laws, vehicle controls, influences on driver behavior, adverse conditions, responsible driving behaviors, time and space management, and basic maneuvers. This course follows the Virginia Standards of Learning for Driver Education classroom instruction, Modules 1-10.

As mandated by the Virginia General Assembly, a 90-minute Partners for Safe Teen Driving presentation is also required for classroom completion. The parent/guardian and teen driver must attend this presentation together (§22.1-205 of the Code of Virginia). Students will not be issued a Driver Education classroom completion card (DEC-1) until this requirement is met.
### Advanced Physical Education I
- **Grades:** 11-12
- **Credit:** 1
- **Prerequisite:** Health and PE 10

This elective course is designed for students who have an interest in maintaining overall fitness for life. Advanced PE promotes an appreciation of the benefits of lifetime physical fitness, with an emphasis placed on self-selection of activities that the student will be likely to continue for a lifetime. Students have the opportunity to develop an advanced level of proficiency in the following areas: individual and dual sports, team sports, weight training and conditioning, personal fitness, recreational activities, and rhythmic activities. Students also develop a fitness portfolio that includes personal fitness goals, nutrition, and healthy choices.

This course may be offered in alternating years.

### American Sign Language I (ASL)
- **Grades:** 9-12
- **Credit:** 1
- **Prerequisite:** None

Students learn basic ASL vocabulary and acquire knowledge of the manual alphabet. They also study the history of American Sign Language and the Deaf culture. Expressive and receptive language skills are practiced within the context of meaningful and experiential activities related to home, school, and community environments.

### World Languages and Cultures

**All public Virginia colleges and universities accept American Sign Language as fulfillment of the world language entrance requirement; however, some Virginia private colleges and out-of-state institutions of higher education do not accept American Sign Language courses for world language credit.**

<table>
<thead>
<tr>
<th>Course</th>
<th>Code</th>
<th>Grades</th>
<th>Credit</th>
<th>Prerequisite</th>
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<td>American Sign Language II</td>
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<td>Grades 11-12</td>
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<td>American Sign Language I</td>
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<tr>
<td>French II</td>
<td>342000</td>
<td>Grades 8-12</td>
<td>1</td>
<td>French I</td>
</tr>
<tr>
<td>French III</td>
<td>343000</td>
<td>Grades 9-12</td>
<td>1</td>
<td>French II</td>
</tr>
</tbody>
</table>
French IV—Honors, weighted 0.5
Grades 10-12
Credit: 1
Prerequisite: French III

Students develop more sophisticated communication skills in French at an intermediate-low level integrating all four language skills: listening, speaking, reading, and writing. Emphasis is placed on the abilities to interact orally and in writing. Authentic language sources are emphasized at this level.

Students communicate using more complex language structures and express abstract ideas with reasonable fluency. Students are able to create and listen with understanding to reports and presentations. They are also able to describe, summarize and discuss selected AP global themes and topics.

French V—Honors, weighted 0.5
Grades 10-12
Credit: 1
Prerequisite: French IV—Honors

Students in French V study AP global themes and topics using more sophisticated communication at an intermediate-mid level in all four language skills: listening, speaking, reading, and writing. Emphasis is placed on the abilities to interact, persuade, compare, and contrast orally and in writing.

Students study literary works as well as current and historical events representing the various geographical regions of the world where French is spoken.

French Advanced Placement, weighted 1.0
Grades 10-12
Credit: 1
Prerequisite: French V—Honors

AP French is holistically designed to offer students a proficiency-based, rigorous college-level experience. This culminating course in French increases student potential in interpretive, interpersonal, and presentational modes in the six global course themes: Global Challenges; Personal and Public Identities; Contemporary Life; Science and Technology; Beauty and Aesthetics; and Families and Communities.

Students build greater fluency in their language skills by developing comprehension and comprehensibility, a rich vocabulary, language control, communication strategies, and cultural awareness. Students are expected to communicate entirely in French as they compare and contrast French cultures with their personal communities and connect their studies with other disciplines in their high school curricula.

Students have the opportunity to take the AP French Exam in May with the possibility of earning college credit.

German I
Grades 7-12
Credit: 1
Prerequisite: None

Students develop the ability to communicate about themselves and their immediate environment in German at the beginner-novice level by producing basic language structures. This communication is evidenced in all four language skills: listening, speaking, reading, and writing. Listening and reading facilitate the ability to communicate orally and in writing.

German II
Grades 8-12
Credit: 1
Prerequisite: German I

Students continue to develop proficiency in German at the intermediate-novice level in all four language skills: listening, speaking, reading, and writing. Emphasis is placed on the ability to communicate orally and in writing.

Students learn to function in real-life situations using more complex sentences and language structures. They also read material on familiar topics and produce short writing samples.

German III
Grades 9-12
Credit: 1
Prerequisite: German II

Students continue to develop and refine their proficiency in German at an advanced-novice level, integrating all four language skills: listening, speaking, reading, and writing. Emphasis is placed on the ability to interact orally and in writing.

Students communicate using more complex language structures on a variety of topics, moving from concrete to more abstract concepts. At this level students comprehend authentic materials to which they listen and read and are able to identify significant details when the topics are familiar.

German IV—Honors, weighted 0.5
Grades 10-12
Credit: 1
Prerequisite: German III

Students develop more sophisticated communication skills in German at an intermediate-low level, integrating all four language skills: listening, speaking, reading, and writing. Emphasis is placed on the abilities to interact, persuade, compare, and contrast orally and in writing.

Students continue to develop proficiency in German at the intermediate-mid level in all four language skills: listening, speaking, reading, and writing. Emphasis is placed on the abilities to interact orally and in writing. Authentic language sources are used at this level.

Students communicate using more complex language structures and express abstract ideas with reasonable fluency. Students are able to create and listen with understanding to reports and presentations in German. They are also able to describe, summarize, and discuss selected AP global themes and topics.

German V—Honors, weighted 0.5
Grades 10-12
Credit: 1
Prerequisite: German IV—Honors

Students study selected AP global themes and topics using more sophisticated communication in German at an intermediate-mid level in all four language skills: listening, speaking, reading, and writing. Emphasis is placed on the abilities to interact, persuade, compare, and contrast both orally and in writing.

Students study literary works as well as current and historical events representing the various geographical regions of the world where German is spoken.

German Advanced Placement, weighted 1.0
Grades 10-12
Credit: 1
Prerequisite: German V—Honors

AP German is holistically designed to offer students a proficiency-based, rigorous college-level experience. This culminating course in German increases student potential in
interpreting, interpersonal, and presentational modes in the six global course themes: Global Challenges; Personal and Public Identities; Contemporary Life; Science and Technology; Beauty and Aesthetics; and Families and Communities.

Students build greater fluency in their language skills by developing comprehension and comprehensibility, a rich vocabulary, language control, communication strategies, and cultural awareness. Students are expected to communicate entirely in German as they compare and contrast target language cultures with their personal communities and connect their studies with other disciplines in their high school curricula.

Students have the opportunity to take the AP German Exam in May with the possibility of earning college credit.

Latin I 350000
Grades 7-12
Credit: 1
Prerequisite: none

This course explores basic Latin grammar and vocabulary and develops the skills necessary to read elementary Latin texts. The linguistic nature of the course is supplemented by a general overview of Greco-Roman civilization, including history, daily life, and mythology. English derivatives are emphasized to show the influence of Latin upon the English language and to contribute to the growth of each student's personal vocabulary.

Latin II 352000
Grades 8-12
Credit: 1
Prerequisite: Latin I

Students review material from Latin I, learn intermediate grammar and vocabulary, and continue to develop skills necessary to read Latin texts. They expand their understanding of Greco-Roman civilization and English derivatives.

Latin III 353000
Grades 9-12
Credit: 1
Prerequisite: Latin II

Students learn advanced grammatical concepts and vocabulary. They read stories of increasing length and complexity that pertain to the expansion of the Roman Empire. The study of Greco-Roman culture and English derivatives continues.

Latin IV—Honors, weighted 0.5 354000
Grades 10-12
Credit: 1
Prerequisite: Latin III

This course introduces students to the reading and interpretation of authentic Latin literature. Students learn the basics of Latin poetry including scansion and literary devices. Emphasis is placed upon Roman culture, Roman history, English derivatives, and Latin grammar relevant to the literary text.

Latin V—Honors, weighted 0.5 355000
Grades 10-12
Credit: 1
Prerequisite: Latin IV—Honors

Latin V pairs a review of Latin grammar and vocabulary with the reading of authentic passages from various Roman authors in preparation for the AP Latin course. It provides students with the skills necessary to translate the authentic text, read aloud Latin

verse in meter, analyze stylistic technique, and interpret the author's intent through word choice, syntax, and mythological and historical allusions. An exploration of the pertinent history and mythology is also incorporated into this class. Students continue to broaden vocabulary through the study of English derivatives.

Latin
Advanced Placement, weighted 1.0 359100
Grades 10-12
Credit: 1
Prerequisite: Latin V—Honors

This course follows the AP Latin syllabus for Vergil’s Aeneid and Caesar’s Gallic War. Students read and translate as literally as possible all required passages and read selected portions of the Aeneid and Gallic War in English. The course examines the historical, social, cultural, and political context of the works and provides frequent practice in reading Latin at sight.

Students are also given frequent opportunities to practice written analysis and critical interpretation, including appropriate references to the use of stylistic and metrical techniques by Vergil and Caesar.

Students have the opportunity to take the AP Latin Exam in May with the possibility of earning college credit.

Mandarin Chinese I 321000
Grades 9-12
Credit: 1
Prerequisite: None

Students are introduced to the Chinese language and culture in this course. The basic objectives are to help each student attain an acceptable degree of proficiency in the four skills of listening, speaking, reading, and writing, and to present the language within the context of the contemporary Chinese culture. Chinese characters are introduced systematically as they are related to the listening/speaking activities conducted.

Mandarin Chinese II 331000
Grades 10-12
Credit: 1
Prerequisite: Mandarin Chinese I

Students continue to build proficiency in the Chinese language and expand their understanding of culture in this course. The basic objectives are to help each student continue to develop an acceptable degree of proficiency in the four skills of listening, speaking, reading, and writing, and to thematically present the language within the context of the contemporary Chinese culture. Chinese characters are reviewed and expanded systematically as they are related to the listening/speaking activities conducted.

Mandarin Chinese III 334000
Grades 11-12
Credit: 1
Prerequisite: Mandarin Chinese II

Students increase proficiency in the basics of Chinese in this course. The objectives of this course are to review and amplify structures previously taught and introduce more advanced vocabulary and structures through the four skills of listening, speaking, reading, and writing and to present the language within the context of the contemporary Chinese culture. Chinese characters are reviewed and more characters introduced systematically as they relate to the listening/speaking activities conducted throughout the course.
Spanish for Fluent Speakers I 367000  
Grades 7-12  
Credit: 1  
Prerequisite: Placement Test

Spanish for Fluent Speakers I is designed to meet the needs of students whose primary language is Spanish and who have minimal or no formal instruction in the language. While developing their current competencies in formal speaking and listening, students focus on the acquisition of comparable competencies in reading and writing.

Upon successful completion of the course, students may continue in the Spanish for Fluent Speakers sequence.

Spanish for Fluent Speakers II 367300  
Grades 7-12  
Credit: 1  
Prerequisite: Spanish for Fluent Speakers I/Placement Test

Spanish for Fluent Speakers II is designed to increase proficiency in reading and writing of students whose primary language is Spanish.

Major grammar points are reviewed and finer points of grammar are studied, placing emphasis on style and structural accuracy. Comprehension and communication skills are refined through the reading and discussion of selections written by classic and modern authors in a variety of genres.

Upon successful completion of the course, students may continue in the Spanish for Fluent Speakers sequence.

Spanish for Fluent Speakers III—Honors, weighted 0.5 367500  
Grades 9-12  
Credit: 1  
Prerequisite: Spanish for Fluent Speakers II/Placement Test

Spanish for Fluent Speakers III is designed to further refine fluent speakers’ literacy and proficiency skills. Students read from a variety of genres representing numerous Spanish-speaking countries. Students discuss current themes and events including world views, global challenges, and students as citizens of a global society.

This course prepares students to enroll in AP Spanish.

Upon successful completion of the course, the student may continue in the traditional Spanish sequence in Spanish V-Honors or AP Spanish.

Spanish I 360000  
Grades 7-12  
Credit: 1  
Prerequisite: None

Students develop the ability to communicate about themselves and their immediate environment in Spanish at the beginner-novice level by producing basic language structures. This communication is evidenced in all four language skills: listening, speaking, reading, and writing. Listening and reading facilitate the ability to communicate orally and in writing.

Spanish II 362000  
Grades 8-12  
Credit: 1  
Prerequisite: Spanish I

Students continue to develop proficiency in Spanish at the intermediate-novice level in all four language skills: listening, speaking, reading, and writing. Listening and reading facilitate the ability to communicate orally and in writing.

Spanish III 363000  
Grades 9-12  
Credit: 1  
Prerequisite: Spanish II

Students continue to develop and refine their proficiency in Spanish at an advanced-novice level integrating all four language skills: listening, speaking, reading, and writing. Emphasis is placed on the ability to interact orally and in writing.

Students communicate using more complex language structures on a variety of topics, moving from concrete to more abstract concepts. At this level, students comprehend authentic materials to which they listen and read and are able to identify significant details when the topics are familiar.

Spanish IV—Honors, weighted 0.5 364000  
Grades 10-12  
Credit: 1  
Prerequisite: Spanish III

Students develop more sophisticated communication skills in Spanish at an intermediate-low level integrating all four language skills: listening, speaking, reading, and writing. Emphasis is placed on the abilities to interact orally and in writing. Authentic language sources are emphasized at this level.

Students communicate using more complex language structures and express abstract ideas with reasonable fluency. Students are able to create and listen with understanding to reports and presentations. They are also able to describe, summarize and discuss selected AP global themes and topics.

Spanish V—Honors, weighted 0.5 365000  
Grades 10-12  
Credit: 1  
Prerequisite: Spanish IV—Honors or Spanish for Fluent Speakers III—Honors

Students in Spanish V study selected AP global themes and topics using more sophisticated communication at an intermediate-mid level in all four language skills: listening, speaking, reading, and writing. Emphasis is placed on the abilities to interact, persuade, compare, and contrast orally and in writing.

Students also study literary works as well as current and historical events representing the various geographical regions of the world where Spanish is spoken.

Spanish Advanced Placement, weighted 1.0 365100  
Grades 10-12  
Credit: 1  
Prerequisite: Spanish V—Honors or Spanish for Fluent Speakers III—Honors

AP Spanish is holistically designed to offer students a proficiency-based, rigorous college-level experience. This culminating course in Spanish increases student potential in interpretive, interpersonal, and presentational modes in the six global course themes: Global Challenges; Personal and Public Identities; Contemporary Life; Science and Technology; Beauty and Aesthetics; and Families and Communities.

Students build greater fluency in their language skills by developing comprehension and comprehensibility, a rich
vocabulary, language control, communication strategies, and cultural awareness. Students are expected to communicate entirely in Spanish as they compare and contrast target language cultures with their personal communities and connect their studies with other disciplines in their high school curricula. Students have the opportunity to take the AP Spanish Exam in May with the possibility of earning college credit.

Introduction to Business & Marketing

Grades 9-11
Prerequisite: None

This entry-level course is offered for all students and recommended as an introduction to the career preparation program in Business & Marketing Education.

Students explore the role of business and marketing in the free enterprise system and the global economy and apply decision-making skills as consumers, employees, and citizens.

Communication and interpersonal skills are developed through various activities.

Marketing Co-Op

Grades 11-12
Credit: 2
Prerequisite: Screening Conference with Instructor; Introduction to Business & Marketing (recommended)

Providing instruction that enables students to hold and succeed in an entry-level job in marketing, the course combines classroom instruction with supervised on-the-job training in a local marketing business.

In this year of the program, students concentrate on developing competencies needed by marketing workers in the areas of human relations, communications, advertising, display, operations, sales, and product and service technology.

The student is provided with a variety of learning methods including practical activities, simulations, computer activities, guest speakers, and role-playing.

Co-op students are expected to stay employed throughout the school year in a teacher-approved, marketing-related job. DECA is an integral part of this course.

Marketing Non-Co-Op

Grades 10-12
Credit: 1

Prerequisite: Screening Conference with Instructor; Introduction to Business & Marketing (recommended)

Advanced Marketing Co-Op

Grades 11-12
Credit: 2

Advanced Marketing Non-Co-Op

Grades 11-12
Credit: 1

Prerequisite: Marketing Co-Op or Marketing Non-Co-Op

Offering training in pre-management level skills and designed for the student who has a firm career interest in marketing, this course allows students to continue the arrangement of combining classroom instruction with supervised on-the-job training in a local marketing business.

Instruction in this year of the program concentrates primarily on the development of competencies in the areas of sales promotion, merchandising, marketing research, and management. Entrepreneurship is an integral part of this class.

The student is provided with a variety of learning methods including practical activities, simulations, computer activities, guest speakers, and role-playing.

Co-op students are expected to stay employed throughout the school year in a teacher-approved marketing-related job. DECA is an integral part of this course.

Sports, Entertainment, & Recreation Marketing

Grades 10-12
Credit: 1

Prerequisite: Introduction to Business & Marketing (Recommended)

Sports, Entertainment, & Recreation Marketing is a course designed for students with an interest in the sports, entertainment, and recreation industry.

This unique and innovative program explores the following areas: an orientation and understanding of the sports, entertainment, and recreation industry; strategic planning; product licensing; dealing with agents and personal managers; examination of concessions and on-site merchandising; market analysis; investigating safety and security procedures; event marketing and execution; and the production of a culminating event and the analysis of the event. DECA is an integral part of this course.

Leadership Development

Grades 9-12
Credit: 0.5

Leadership Development

Grades 9-12
Credit: 1

Prerequisite: None

Credit of 0.5 or 1 varies by school

This course is designed to equip students with personal and group leadership skills. Course content includes units in principles of leadership, parliamentary law, speaking in public, developing effective communications and human relations skills, and developing positive public relations.

School and community leadership opportunities are used to provide practical application of the course content.
Algebra I, Part 1* 54 2000
Grades 9-12 Credit: 1*
Prerequisite: Mathematics 8
Algebra I, Part 1 supports and promotes student success in mathematics coursework necessary to fulfill graduation requirements. While strengthening prerequisite skills in the areas of operations with whole numbers, fractions, decimals, percentages, integers, and rational numbers, algebraic concepts are solidified through modeling and the use of manipulatives, graphing calculators, and computer software where appropriate. A concentration on improving problem solving and communication in mathematics builds student confidence. Students may earn one mathematics credit for the Standard Diploma with Credit Accommodations by successfully completing Algebra I, Part 1.

Algebra I, Part 2* 54 3000
Grades 9-12 Credit: 1* (If completed in conjunction with Algebra I, Part 1)
Prerequisite: Algebra I, Part 1
Algebra I, Part 2 supports and promotes student success in mathematics coursework necessary to fulfill graduation requirements. The study of linear and quadratic equations, linear inequalities, systems of equations, and functions inherent in Algebra are emphasized in the course. Graphing calculators and other emerging technologies are used to facilitate problem solving, data analysis, and transformational graphing. Students should consult with a school counselor about the credits that may be used to fulfill the mathematics requirements for a high school diploma.

*For students entering the 9th grade for the first time in 2009-2010 or after, these courses may only be used as mathematics credits to fulfill the requirements of a Standard Diploma with Credit Accommodations.
Prerequisite: Algebra II

Algebra II/Trigonometry, weighted 0.5
Grades 9-12
Credit: 1

SOL Test
Algebra II/Trigonometry provides a thorough study of functions, including parent functions, families of functions, and transformational graphing. Transformational graphing uses translations, reflections, dilations, and rotations, to generate a family of graphs from a parent graph. The continued study of equations, systems of equations, inequalities, and systems of inequalities builds on Algebra I concepts while polynomials, imaginary numbers in the complex number system, and sequences and series allow additional opportunities for modeling and practical applications.

The study of trigonometry includes trigonometric definitions, applications, equations, and inequalities. The connections between right triangle ratios, trigonometric functions, and circular functions are emphasized.

Graphing calculators and other emerging technologies are incorporated into instruction to enhance teaching and learning. Mathematical communication, reasoning, problem solving, critical thinking, and multiple representations are emphasized throughout the course.

Statistics and Probability
Grades 10-12
Credit: 0.5

Prerequisite: Algebra II

Elementary probability and statistics are studied with an emphasis on collecting data and interpreting data through numerical methods. Specific topics include the binomial and normal distributions, probability, linear correlation and regression, and other statistical methods. Students are expected to understand the design of statistical experiments. They are encouraged to study a problem, design and conduct an experiment or survey, and
interpret and communicate the outcomes. Through meaningful activities and simulations, students are provided with experiences that model the means by which data are collected, used, and analyzed. This course enables students to be wise users of statistical methods and more critical consumers of statistical materials.

Graphing calculators and other emerging technologies are incorporated into instruction to enhance teaching and learning. Mathematical communication, reasoning, problem solving, critical thinking, and multiple representations are emphasized throughout the course.

**Discrete Mathematics**

**Grades 10-12**

**Credit: 0.5**

**Prerequisite: Algebra II**

Discrete Mathematics involves applications using discrete variables rather than continuous variables. Modeling and understanding finite systems is central to the development of the economy, the natural and physical sciences, and mathematics itself.

This course introduces the topics of social choice as a mathematical application, matrices and their uses, graph theory and its applications, and counting and finite probability, as well as the processes of optimization, existence, and algorithm construction.

Graphing calculators and other emerging technologies are incorporated into instruction to enhance teaching and learning. Mathematical communication, reasoning, problem solving, critical thinking, and multiple representations are emphasized throughout the course.

**Advanced Functions and Modeling**

**Grades 10-12**

**Credit: 1**

**Prerequisite: Algebra II**

Advanced Functions and Modeling provides opportunities for students to deepen understanding and knowledge of functions-based mathematics through investigations of mathematical models and interpretation/analysis of data from real-life situations. Problem solving and critical thinking provide the structure in which functions (polynomial, exponential, logarithmic, transcendental, and rational) are studied. Experimental design provides the foundation for data gathering, curve sketching, and curve fitting in order to provide a graphical interpretation of real world situations.

Graphing calculators and other emerging technologies are incorporated into instruction to enhance teaching and learning. Mathematical communication, reasoning, problem solving, critical thinking, and multiple representations are emphasized throughout the course.

**Advanced Algebra/Precalculus**

**Grades 10-12**

**Credit: 1**

**Prerequisite: Algebra II**

Advanced Algebra/Precalculus emphasizes polynomial, exponential, logarithmic, and rational functions, theory of equations, sequences and series, conic sections, limits, mathematical induction, and the Binomial Theorem. Trigonometry topics include triangular and circular definitions of the trigonometric functions, establishing identities, special angle formulas, Law of Sines, Law of Cosines, and solutions of trigonometric equations. Constructing, interpreting, and using graphs of the various function families are stressed throughout the course of study. Students are encouraged to explore fundamental applications of the topics studied with the use of graphing calculators.

Mathematical communication, reasoning, problem solving, critical thinking, and multiple representations are emphasized throughout the course.

**Mathematical Analysis, weighted 0.5**

**Grades 9-12**

**Credit: 1**

**Prerequisite: Algebra II/Trigonometry or Advanced Algebra/Precalculus**

Mathematical Analysis introduces mathematical induction, matrix algebra, vectors, and the Binomial Theorem. A detailed treatment of function concepts provides opportunities to explore mathematics topics deeply and to develop an understanding of algebraic and transcendental functions, parametric and polar equations, sequences and series, conic sections, and vectors. Mathematical Analysis also includes precalculus topics such as limits and continuity, the derivative of functions of a single variable, and curve sketching. The course of study is enhanced by making connections to the concepts presented to other disciplines.

Students routinely use graphing calculators as tools for exploratory activities and for solving rich application problems. Mathematical communication, reasoning, problem solving, critical thinking, and multiple representations are emphasized throughout the course.

**Computer Mathematics—Introduction to Computer Science**

**Grades 9-12**

**Credit: 1**

**Co-requisite: Algebra II**

Computer Mathematics serves as an introduction to Computer Science and to object-oriented programming using Java. Students will learn to design graphical interfaces, write browser applets, and create their own games using the principles of OOP (object-oriented programming) using user defined objects, encapsulation of data, and libraries. Students develop and refine skills in logic, organization, and precise expression, thereby enhancing learning in other disciplines. Programming is introduced in the context of mathematical concepts and problem solving. Students define a problem; develop, refine, and implement a plan; and test and revise the solution.
<table>
<thead>
<tr>
<th>Subject</th>
<th>Advanced Placement, weighted 1.0</th>
<th>Credit: 1</th>
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<tbody>
<tr>
<td><strong>Computer Science A</strong></td>
<td>595100</td>
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<tr>
<td>Grades 10-12</td>
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<tr>
<td>Prerequisites: Computer Mathematics and Algebra II or Principal permission</td>
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AP Computer Science A is taught according to the syllabus for Computer Science A available through the College Entrance Examination Board. Major topics in the course include programming methodology, algorithms, and data structures. Topics are extended to include constructs, data types, functions, testing, debugging, algorithms, and data structures. The JAVA programming language is used to implement computer-based solutions to meaningful problems. Treatments of computer systems and the social implications of computing are integrated into the course.

Students have the opportunity to take the AP Computer Science A Exam in May with the possibility of earning college credit.

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<th>Subject</th>
<th>Advanced Placement, weighted 1.0</th>
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<tr>
<td><strong>Calculus AB</strong></td>
<td>585100</td>
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<tr>
<td>Grades 11-12</td>
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<td></td>
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<tr>
<td>Prerequisite: Mathematical Analysis or Advanced Algebra/Precalculus</td>
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</table>

AP Calculus AB explores the topics of limits/continuity, derivatives, and integrals. These ideas are examined using a multi-layered approach including the verbal, numerical, analytical, and graphical analysis of polynomial, rational, trigonometric, exponential, and logarithmic functions and their inverses. The student is expected to relate the connections among these approaches. Students are also required to synthesize knowledge of the topics of the course to solve applications that model physical, social, and/or economic situations. These applications emphasize derivatives as rates of change, local linear approximations, optimizations and curve analysis, and integrals as Reimann sums, area of regions, volume of solids with known cross sections, average value of functions, and rectilinear motions. Emerging technologies are incorporated into the curriculum as they become available.

Students have the opportunity to take the AP Calculus AB Exam in May with the possibility of earning college credit.

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<th>Subject</th>
<th>Advanced Placement, weighted 1.0</th>
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<tr>
<td><strong>Calculus BC</strong></td>
<td>586100</td>
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<tr>
<td>Grades 11-12</td>
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<tr>
<td>Prerequisite: Mathematical Analysis or Advanced Placement</td>
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Advanced Placement Calculus BC is intended for students who have a thorough knowledge of analytic geometry and elementary functions in addition to college-preparatory algebra, geometry, and trigonometry. Although all of the elements of the AP Calculus AB course are included, the course provides a more rigorous treatment of these introductory calculus topics. The course also includes the development of the additional topics required by the College Entrance Examination Board in its syllabus for AP Calculus BC. Among these are parametric, polar, and vector functions; the rigorous definition of limit; advanced integration techniques; Simpson’s Rule; length of curves; improper integrals; Hooke’s Law; and the study of sequences and series. The use of the graphing calculator is fully integrated into instruction and students are expected to confirm and interpret results of problem situations that are solved using available technology. Emerging technologies are incorporated into the curriculum as they become available.

Students have the opportunity to take the AP Calculus BC Exam in May with the possibility of earning college credit.

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<th>Subject</th>
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<tr>
<td><strong>Statistics</strong></td>
<td>598100</td>
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<td>Grades 9-12</td>
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<td>Prerequisite: Algebra II</td>
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The AP Statistics course explores the concepts and skills according to the syllabus available through the College Entrance Examination Board. These topics include collecting and interpreting data through numerical methods, binomial and normal distribution, probability, linear correlation and regression, analysis of variance, and other descriptive statistical methods. Students should be able to transform data to aid in data interpretation and prediction and test hypotheses using appropriate statistics. Emerging technologies are incorporated into the curriculum as they become available.

Students have the opportunity to take the AP Statistics Exam in May with the possibility of earning college credit.

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<th>Subject</th>
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<tr>
<td><strong>Multivariable Calculus</strong></td>
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<tr>
<td><strong>Multivariable Calculus</strong></td>
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<tr>
<td>Grades 11-12</td>
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<td>Prerequisite: Calculus BC—Advanced Placement</td>
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Multivariable calculus (also known as multivariate calculus) is the extension of calculus in one variable to calculus in several variables. Topics may include Euclidean 3-space, vector functions, derivatives and curvature and torsion, \( \mathbb{R}^n \) space, surface normals, the Taylor polynomial, power and Taylor series, multivariable integration, vector function integration, and theorems by Gauss, Green, and Stokes.
Music Appreciation 260000
Grades 9-12
Credit: 1
Prerequisite: None

Exploring the impact of music throughout the ages helps students become informed consumers and culturally aware participants in the 21st century. Students explore music in a wide variety of musical styles and time periods in this course. They will explore the relationship of music to art, architecture, and history, as well as the use of music technology in today’s music. A lively curiosity and an interest in exploring the power of music are the only prerequisites for this class.

Music Theory/History 262000
Grades 9-12
Credit: 1
Prerequisite: None

The ability to understand and converse in the language of written music is the key to gaining a deeper understanding of the music that surrounds people. Students develop their keyboard skills through original musical compositions, build critical thinking skills, and compare musical examples. This course is recommended for students planning to pursue music in college and for the joy of creation to anyone who loves music. No performance is required.

INSTRUMENTAL MUSIC COURSES

Instrumental Methods 270000
Grades 9-12
Credit: 1
Prerequisite: Teacher Recommendation/Audition

Students develop fundamental playing skills on musical instruments in a supportive environment in the Instrumental Methods class. They receive special coaching in the areas of tone production, music reading, fingerings, and playing in an ensemble. Public performances are not stressed, but a concert may be planned at the teacher’s discretion.

Performance Ensemble I 272000
Grades 9-12
Credit: 1
Prerequisite: Teacher Recommendation/Audition

This performance-oriented band participates in concert appearances and Virginia Music Education Association events. Students continue the in-depth mastery of basic fundamentals of music while preparing pieces for performances. As a co-curricular ensemble, performances and rehearsals outside regular school hours are required.

Performance Ensemble II 274000
Grades 9-12
Credit: 1
Prerequisite: Teacher Recommendation/Audition

Students in this class expand their knowledge and skills of instrumental techniques, tone production, musical interpretation, and ensemble/solo performance to an advanced level. Performance Ensemble II is a performance-oriented class, and students are active in numerous concerts and events. As a co-curricular ensemble, performances and rehearsals outside regular school hours are a requirement.

Beginning Orchestra 275004
Grades 9-12
Credit: 1
Prerequisite: None

This class is open to students who wish to learn how to play an orchestral string instrument but have no previous musical experience. Attention is focused on the development and understanding of fundamental string techniques including proper tone production, bow hold, hand positions, and aural and notation reading skills. Students are expected to supply their own instruments.

Intermediate Orchestra 275003
Grades 9-12
Credit: 1
Prerequisite: Successful completion of LCPS middle school orchestra program, High School level Beginning Orchestra, or teacher recommendation.

Students in the Intermediate Orchestra continue to develop proper tone production, style, playing technique, and appropriate ensemble skills while preparing musical selections for performance. As a co-curricular ensemble, performances outside regular school hours are a requirement.

Advanced Orchestra 275002
Grades 9-12
Credit: 1
Prerequisite: Successful completion of HS Intermediate level or teacher recommendation.

Technical and expressive skills increase in difficulty as students demonstrate mastery of a variety of articulations, bowings, positions, required scales, and arpeggios. Students at the advanced level perform, discuss, and critically evaluate characteristics of more elaborate musical compositions. This is a performance-oriented class, and students are active in numerous concerts and events. As a co-curricular ensemble, performances outside regular school hours are a requirement.

Artist Orchestra 275001
Grades 9-12
Credit: 1
Prerequisite: Successful completion of HS Advanced level or teacher recommendation.

Students who perform at the Artist level have built upon and mastered the previous high school skill levels of Beginning, Intermediate, and Advanced Orchestra. The Artist Orchestra student demonstrates exceptional skill level and is able to perform, discuss, analyze, and critically evaluate characteristics of more elaborate music compositions from a variety of styles, cultures, and historical periods. The ensemble is performance-oriented and is involved in concert appearances and county, regional, and state events. As a co-curricular ensemble, performances outside regular school hours are a requirement.
Jazz Ensemble 276000
Grades 9-12
Credit: 1
Prerequisite: Teacher Recommendation/Audition
The basic fundamentals of jazz—theory, interpretation, improvisation, and other techniques—are covered in this performance-oriented class. As a co-curricular ensemble, performances and rehearsals outside regular school hours are a requirement.

Beginning Guitar 293000
Grades 9-12
Credit: 1
Prerequisites: None
This class is open to students with no previous musical experience. The purpose of this course is to prepare students for a lifetime of guitar playing and music appreciation. Topics include standard musical notation; knowledge of the fretboard through fifth position; introduction to left and right hand techniques, including fingerstyle and pick technique; fundamentals of music; chords; basic song accompaniment; music history; listening; and understanding of guitar terminology. The class also includes solo and ensemble literature. A variety of musical styles are explored. Students must supply a standard nylon string classical guitar.

Intermediate Guitar 294000
Grades 9-12
Credit: 1
Prerequisite: Successful completion of Beginning Guitar, Audition, or Teacher Recommendation.
This class is open to students who have completed the LCPS guitar program in the middle school or have successfully completed the Beginning Guitar class at the high school level. Students who do not meet these prerequisites may be accepted by audition. The purpose of this course is to prepare students for a lifetime of guitar playing and music appreciation. Topics include completion of the fingerboard, refinement of right and left hand technique, advanced chord forms, scales, improvisation, and solo and ensemble repertoire. A variety of musical styles are explored. The ensemble is performance-oriented and is involved in concert appearances and county events. As a co-curricular ensemble, performances outside regular school hours are a requirement. Students must supply a standard nylon string classical guitar.

Advanced Guitar 295000
Grades 9-12
Credit: 1
Prerequisites: Successful completion of Intermediate Guitar, Audition or Teacher Recommendation.
This class is open to students who have completed Intermediate Guitar. Students who have not completed Intermediate Guitar may be accepted by audition. The purpose of this course is to prepare students for a lifetime of guitar playing and music appreciation. Topics include mastery of the fingerboard, refinement of right and left hand technique, advanced chord forms, scales, improvisation, and advanced solo and ensemble repertoire. A variety of musical styles are explored. The ensemble is performance-oriented and is involved in concert appearances and county events. As a co-curricular ensemble, performances outside regular school hours are a requirement. Students must supply a standard nylon string classical guitar.

Artist Level Guitar 296000
Grades 9-12
Credit: 1
Prerequisites: Successful completion of Advanced Guitar, audition and teacher recommendation.
Students who perform at the Artist level have built upon and mastered the previous skill levels of Beginning, Intermediate, and Advanced Guitar. Artist Level Guitar students perform, discuss, analyze, and critically evaluate characteristics of more elaborate music compositions from a variety of styles. The ensemble is performance-oriented and is involved in concert appearances and county events. As a co-curricular ensemble, performances outside regular school hours are a requirement. Students must supply a standard nylon string classical guitar.

Music Theory
Advanced Placement, weighted 1.0 262100
Grades 9-12
Credit: 1
Prerequisites: Successful completion of Music Theory/History (262200) and/or teacher recommendation.
Students in Advanced Placement Music Theory learn to recognize, understand, analyze and describe elements of music theory through composition, aural skills (ear-training, dictation, and sight-singing), notation terminology, and score analysis. Students in AP Music Theory are highly encouraged to be active in some form of music performance or composition.
Students have the opportunity to take the AP Music Theory Exam in May with the possibility of earning college credit.

Vocal Music Courses
Mixed Chorus 280000
Grades 9-12
Credit: 1
Prerequisite: None
Mixed Chorus provides a singing experience for students who have no background in choral music. Through participation in performances, students build self-confidence and the concept of teamwork. Basic vocal technique, music literacy and sight reading are components of this class. Students will develop choral literacy by singing a wide variety of choral literature that is both sacred and secular. Participation in ensemble performances is required.

Small Vocal Ensemble 278000
Grades 9-12
Credit: 1
Prerequisite: Audition
The Small Vocal Ensemble offers unique opportunities for highly motivated and dedicated singers who can perform at a high level of proficiency. Students receive specialized coaching in singing techniques and perform music in a wide variety of styles. Music literacy and sight reading are components of this class. Students will develop choral literacy by singing literature that is sacred and secular. Participation in ensemble performances is required.
Advanced Mixed Chorus 282000  
Grades 9-12  
Credit: 1  
Prerequisite: Audition  
Advanced Chorus is a select group of highly motivated and committed students who are seeking a more intense performance experience. Members of this group will continue to build their individual skills by performing in a variety of settings. Students will develop choral literacy by singing a wide variety of choral literature that is both sacred and secular. Music literacy and sight reading are components of this class. Participation in concerts as well as certain choral competitions is required.

Men's Chorus 284000  
Grades 9-12  
Credit: 1  
Prerequisite: Audition  
Auditioned Men's Chorus is a select group of men who have the opportunity to perform three and four-part music written for the male voice. Members of this group continue to build their vocal skills by performing in a variety of settings. Music literacy and sight reading are components of this class. Students will develop choral literacy by singing a wide variety of choral literature that is both sacred and secular. Participation in concerts as well as certain choral competitions is required.

Women's Chorus 286000  
Grades 9-12  
Credit: 1  
Prerequisite: Audition  
Auditioned Women's Chorus is a select group of women who have the opportunity to perform three and four-part music written for the female voice. Members of this group continue to build their vocal skills by performing in a variety of settings. Music literacy and sight reading are components of this class. Students will develop choral literacy by singing a wide variety of choral literature that is both sacred and secular. Participation in concerts as well as certain choral competitions is required.

Men's Chorus 284001  
Grades 9-12  
Credit: 1  
Prerequisite: None  
Men who have no prior singing experience have the opportunity to participate in Men's Chorus. Through participation in performances, students build self-confidence and the concept of teamwork. Basic vocal technique, music literacy and sight reading are components of this class. Students will develop choral literacy by singing a wide variety of choral literature that is both sacred and secular. Participation in ensemble performances is required.

Women's Chorus 286001  
Grades 9-12  
Credit: 1  
Prerequisite: None  
Women who have no prior singing experience have the opportunity to participate in Women's Chorus. Through participation in performances, students build self-confidence and the concept of teamwork. Basic vocal technique, music literacy and sight reading are components of this class. Students will develop choral literacy by singing a wide variety of choral literature that is both sacred and secular. Participation in ensemble performances is required.

Naval Science I 848000  
Grades 9-12  
Credit: 1  
Prerequisite: None  
Offered at LCHS only*  
This introductory course to the NJROTC program is intended to stimulate enthusiasm for scholarship as a foundation for higher citizenship and leadership. The Junior Reserve Officer's Training Corps (JROTC) is a federal program sponsored by the United States Armed Forces in high schools across the United States.

Naval Science II 849000  
Grades 10-12  
Credit: 1  
Prerequisite: Naval Science I  
Offered at LCHS only*  
This second-year course builds on the general introduction provided in Naval Science I to further develop the traits of citizenship and leadership in cadets, introduce cadets to technical areas of naval science, and engender a deeper awareness of the vital importance of the world oceans to the continued well-being of the United States.

Naval Science III 847000  
Grades 11-12  
Credit: 1  
Prerequisite: Naval Science I and II  
Offered at LCHS only*  
This third-year course builds on the general information covered in Naval Science I and II and further develops the traits of citizenship and leadership in cadets, introduces cadets to technical areas of naval science, and engenders a deeper awareness of the vital importance of the world oceans to the continued well-being of the United States. Students continue to develop their leadership skills through
working as command and staff leaders. Additional communication skills are developed, including methods of instruction, preparation, and proper conduct of cadet-led classes. Human relations, group dynamics, orienteering, contemporary United States issues, and advanced military history studies are also included.

*Students enrolled at all other LCPS high schools may apply to attend the NJROTC program at LCHS on a space-available basis. Interested students should talk with their home school counselors for further information.

Naval Science IV
Grade 12
Credit: 1
Prerequisite: Naval Science I, II, and III

Offered at LCHS only*

This fourth-year course builds on the general information covered in Naval Science I, II, and III and develops leadership skills through working as command and staff leaders. Additional communication skills are developed, including methods of instruction, preparation, and proper conduct of cadet-led classes. Human relations, group dynamics, orienteering, contemporary United States issues, and advanced military history studies are also included.

*Students enrolled at all other LCPS high schools may apply to attend the NJROTC program at LCHS on a space-available basis. Interested students should talk with their home school counselors for further information.

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**Science**

All of the science classes listed are laboratory science courses. Earth Science, Biology, and Chemistry all require the Virginia Standards of Learning tests near the end of the courses.

Students seeking a Standard diploma must complete a minimum of three science classes in two different disciplines. Students seeking Advanced Studies Diplomas must complete a minimum of four science classes in three different disciplines.

Because requirements for college admission and for specific majors in college differ greatly, students should check with colleges of interest to determine the science courses most appropriate to their goals of future education and potential college majors.

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Research Earth Science—Honors, weighted 0.5
Grades 9-10
Credit: 1
Prerequisite: None

*Students enrolled at all other LCPS high schools may apply to attend the NJROTC program at LCHS on a space-available basis. Interested students should talk with their home school counselors for further information.

Students begin to develop expertise needed to conduct in-depth scientific research. In particular, students gain the ability to collect and communicate data with descriptive statistics and graphical representations. In addition, students learn skills to use data and scientific knowledge to develop conclusions about their research questions.

All Research Earth Science students are expected to complete an in-depth, independent Science Research Investigation (SRI) as a required part of their course work.

Research Earth Science students may participate in the process leading to possible selection for participation in the Loudoun County Regional Science and Engineering Fair (RSEF).

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Research Biology—Honors, weighted 0.5
Grades 9-10
Credit: 1
Prerequisite: None

*Students enrolled at all other LCPS high schools may apply to attend the NJROTC program at LCHS on a space-available basis. Interested students should talk with their home school counselors for further information.

Research Biology is designed to give students multiple experiences conducting science research as a means to develop biology content knowledge and scientific thinking. Students interpret biological information and utilize technology, and biological protocols to organize and analyze data.

Students learn the role that scientific evidence and scientific thinking plays in development of new scientific knowledge in the field of biology. Students are expected to collect and communicate data with descriptive statistics and graphical representations. In addition, students answer research questions using scientific data and draw conclusions using their biological content knowledge.

During Research Biology, students develop the science thinking and process skills required to generate a scientific research question and design an investigation to collect data that will answer their question. Additionally, students develop a deeper understanding of the role of inferential statistics in data analysis and drawing conclusions.

All Research Biology students are expected to complete an in-depth, independent Science Research Investigation (SRI) as a required part of their course work.

Research Biology students may participate in the process leading to possible selection for participation in the Loudoun County Regional Science and Engineering Fair (RSEF).
Students report findings of both qualitative and quantitative data to adjust stoichiometry, reactions, and equations, and chemical equilibrium. Students investigate kinetic theory, the Periodic Table, and atomic structure.

Prerequisites: Biology—Honors or Academic and Chemistry (completed or taken concurrently). Students must attain a passing score on the Biology SOL Test. This advanced course is a college-level, fast-paced course that follows the course outline of the College Board's AP program. The course emphasizes cellular biology, biochemical processes of cellular respiration and photosynthesis, vertebrate anatomy and physiology, advanced genetics, evolution, plant anatomy and physiology, and ecology.

Students have the opportunity to take the AP Biology Exam in May with the possibility of earning college credit.

Chemistry

Grades 10-12
Credit: 1
Prerequisites: Algebra I. Students must attain a passing score on the Algebra I SOL Test.

SOL Test: Chemistry students develop an appreciation for the interaction between matter and energy. Students investigate the structure, properties, and reactions of matter. Classroom study is balanced with laboratory experiences to deepen the students' understanding of Chemistry. Analytical experimental investigations are conducted using the scientific method, and proper safety precautions are employed. Students investigate kinetic theory, the Periodic Table, stoichiometry, reactions and equations, and chemical equilibrium. Students report findings of both qualitative and quantitative data using effective communication skills, correct expression of significant figures and error, and factor labeling in problem solving.

Chemistry is designed as a challenging course requiring advanced reading and writing skills.

Chemistry

Advanced Placement, weighted 1.0

Grades 10-12
Credit: 1
Prerequisites: Chemistry. Students must attain a passing score on the Chemistry SOL Test.

This advanced course is a college-level, fast-paced course in Chemistry that follows the course outline of the College Board's AP Chemistry Program. The course includes many extended lab procedures. In addition, such fields as organic chemistry, biochemistry, nuclear chemistry, coordination complexes, and semi-micro qualitative analysis are introduced.

Students have the opportunity to take the AP Chemistry Exam in May with the possibility of earning college credit.

Environmental Science

Grades 11-12
Credit: 1
Prerequisites: Two Science Credits (Earth Science and Biology) (completed or taken concurrently). Students must attain a passing score on 2 science SOL tests (to be chosen from Earth Science, Biology, and/or Chemistry).

Environmental Science provides the opportunity to synthesize information and knowledge of physics, chemistry, earth science, and biology while developing the Naturalist Intelligence. Students gain an understanding of ecological concepts including air, water, soil, biological diversity, and human impacts. Inquiry skills are developed through fieldwork, service projects, and collaborative investigation while using appropriate technology. Because of the interdisciplinary focus of the course, students are challenged with diverse topics, rigorous reading requirements, and opportunities for written and oral presentations.

Environmental Science

Advanced Placement, weighted 1.0

Grades 10-12
Credit: 1
Prerequisites: Earth Science—Honors or Academic and Biology (completed or taken concurrently). Students must attain a passing score on the Earth Science and Biology SOL Test.

This advanced course is a college-level, fast-paced course that follows the course outline of the College Board's AP program. The goal of the AP Environmental Science course is to provide students with the scientific principles, concepts, and methodologies required to understand the interrelationships of the natural world, to identify and analyze environmental problems both natural and human-made, to evaluate the relative risks associated with these problems, and to examine alternative solutions for resolving or preventing them.

Students have the opportunity to take the AP Environmental Science Exam in May with the possibility of earning college credit.

Conceptual Physics

Grades 10-12
Credit: 1
Prerequisite: Algebra I. Students must attain a passing score on the Algebra I SOL Test.

Students build on basic physical science principles by in-depth exploration of the nature and characteristics of energy and its dynamic interaction with matter. Topics include mechanics, electricity and magnetism, waves and optics, and nuclear energy.

The course draws connections between the concepts of physics and many everyday applications.

Students who are awarded a credit for Conceptual Physics cannot receive an additional credit for Physics 670000.

Physics

Grades 11-12
Credit: 1
Prerequisite: Algebra II

This course uses a highly mathematical approach. Students learn and use many algebraic and trigonometric concepts while investigating physics content. Laboratory work includes graphical analysis. Topics include mechanics, electricity and magnetism, waves and optics, the Special Theory of Relativity, and atomic structure.
Physics is designed as a challenging course requiring advanced reading, writing, and mathematical skills.
Students who have previously completed Conceptual Physics are not awarded another science credit for taking Physics 670000.

**Physics C**
**Advanced Placement, weighted 1.0** 675100
Grades 11-12  Credit: 1
**Prerequisite:** Physics
**Co-requisite:** Calculus

This course is a fast paced, college-level course in Physics that follows the course outline of the College Board's AP Physics program. Emphasis is placed on mechanics. Students study concepts in each of the following six content areas: kinematics; Newton's laws of motion; work, energy and power; systems of particles and linear momentum; circular motion and rotation; and oscillations and gravitation.

Pre-Calculus and Calculus skills are used to develop concepts and solve problems.

Students have the opportunity to take the AP Physics C Exam in May with the possibility of earning college credit.

**Geospatial Science** 670201

**Geospatial Science—**
**Dual Enrollment, weighted 0.5** 670200
Grade 12  Credit: 1
**Prerequisite:** None

Geospatial science involves the use of geographic information systems (GIS) which integrate hardware, software, and data for capturing, managing, analyzing, and displaying all forms of geographically-referenced information. In this course, GIS is used to organize, analyze, and communicate spatial-data relationships.

In the first semester, students learn about GIS tools and acquire the essential skills necessary to use GIS software and hardware effectively. These computer/software skills form the foundation of the course and are used extensively as students conduct independent research later in the course. Teacher-directed activities gradually lead to more student-directed research.

**All students are expected to complete an in-depth research project as a required part of their course work during the second semester.**

Students may also choose a dual enrollment option offered through a partnership with James Madison University’s (JMU) Department of Geology and Geography. Students have the opportunity to earn 6 college credits from JMU while completing the in-depth research project. The project (mandatory for all students regardless of whether they choose the dual enrollment option) requires students to apply all skills acquired during the first semester, identify a suitable independent research topic, and demonstrate their ability to complete and present their project to school faculty, members of the GIS community, and JMU faculty and staff. To earn the 6 credit hours, students must meet or exceed the project expectations established by JMU.

This course cannot be used to satisfy one of the science requirements for the Standard or Advanced Studies Diploma.

**Geospatial Science II—**
**Dual Enrollment, weighted 0.5** 670300

**Prerequisite:** Completion of Geospatial Science and approval of JMU faculty.

Students enrolled in Geospatial Science II deepen their expertise, gained in Geospatial Science, with an emphasis on acquiring advanced skills to capture, manage, analyze and display geographically referenced information. These skills include; displaying and analyzing data, building and working with databases, understanding and incorporating geographic and projected coordinate systems, and using remote sensing and LiDAR data.

All students are expected to complete an in-depth research project as a required part of their course work during the year, with expectations of submitting their work into various competitions.

Geospatial Science II is a dual enrollment course offered through a partnership with James Madison University’s (JMU) Department of Geology and Geography. Students earn 6 college credits from JMU while completing an in-depth research project. The research project requires students to apply all skills acquired during Geospatial Science, identify a suitable independent research topic, and demonstrate their ability to complete and present their project to school faculty, members of the GIS community, and JMU faculty and staff. To earn the 6 credit hours, students must meet or exceed the project expectations established by JMU.

This course cannot be used to satisfy one of the science requirements for the Standard or Advanced Studies Diploma.

**Independent Science Research, weighted 0.5** 680000

**Independent Science Research—**
**Dual Enrollment, weighted 0.5** 680100
Grades 11-12  Credit: 1
**Prerequisite:** Completion of at least two sciences in different disciplines (to be chosen from Earth Science, Biology, Chemistry, Physics, or AP Sciences).

This elective science course is intended for juniors and seniors interested in continuing their study through an independent project in science, engineering, mathematics, or computer science. Students participating in Independent Science Research (ISR) should have a significant science background prior to entering the course. ISR projects are subject to considerable peer and teacher review during all phases of development.

The focus of this course is on sustained, scientific inquiry. Students are expected to take responsibility for project development, meeting timelines, collecting data, defending procedures, and presenting results.

The instructor advises students on the research process, information sources, and contacts. Instruction is also provided on such topics as data collection and presentation, statistical interpretation of results, protocols for research, and presentation skills.

All ISR students are required to participate in the process leading to possible selection for participation in the Loudoun County Regional Science and Engineering Fair.

All students are expected to complete an in-depth research project as a required part of their course work.

Students may choose a dual enrollment option offered through a partnership with George Mason University (GMU),
College of Science. Students have the opportunity to earn 3 college credits from GMU while completing the in-depth research project. The project (mandatory for all students regardless of whether they choose the dual enrollment option) requires students to identify a suitable research topic, develop an investigation design and demonstrate their ability to complete and present their project to LCPS, GMU faculty and staff and the scientific community. To earn the 3 credits, students must meet or exceed the project expectations established by GMU.

*Students working toward an Advanced Studies Diploma must also complete 3 science courses from different disciplines in order to acquire the 4 required science credits (to be chosen from Earth Science, Biology, Chemistry, Physics, or AP Sciences).

World History/Geography 1500 to 1500

Pre-AP, weighted 0.5 740900
Sequenced for Grade 9 Credit: 1
Prerequisite: None

SOL Test Starting with the human communities of early world history, this course teaches students to think critically about large global patterns and themes and to compare human characteristics across time and geographic locations. Students learn about people in different places and environments from 8000 BCE to 1500 CE and gain understanding of the connections, and differences, between human beings as they study historical trends and events.

Since writing is a thinking process, all forms of writing, both formal and informal, are emphasized in this course. Students learn to understand and use primary sources as historical evidence to conduct research and produce essays.

This is a course in global history and serves as the foundation course for the 10th grade AP World History class.

World History/Geography to 1500

Academic 740300
Grade 9 Credit: 1
Prerequisite: None

SOL Test In this course, students learn to think critically about world events and societies around the globe before the year 1500. They learn to think in an organized way to understand history and to express themselves in all forms of writing, both formal and informal.

This is a course in the human history of the world that asks the following questions: What changes and events have caused people to live the way they do today? What progress have humans made? What problems have humans faced? What problems still exist today?

World History/Geography

Advanced Placement, weighted 1.0 751000
Grades 10-12 (Sequenced for Grade 10) Credit: 1
Prerequisite: World History/Geography I

SOL Test Today individuals live in a global world that allows them to log on to a computer and talk live to other students in China, India, or South Africa. AP World History helps students understand how different societies developed the way they did and prepares students to live in a global, interconnected society.

In AP World History students expand their ability to think clearly and carefully about social and historical forces that have shaped their lives. They compare the roles of different groups of people, including young people, in different times and places.

Students learn to think in an organized way to understand history and to express themselves in all forms of writing, both formal and informal. They also have a chance to complete an inquiry-based project on a World History topic of personal interest.

This course teaches students to think critically and to develop the ability to use evidence to make arguments and draw conclusions.

Students have the opportunity to take the AP World History Exam in May with the possibility of earning college credit.

World History/Geography 1500 to present

Academic 745300
Grade 10 Credit: 1
Prerequisite: None

SOL Test Today individuals live in a global world that allows them to log on to a computer and talk live to other students in China, India, or South Africa. World History helps students understand how different societies developed the way they did and prepares students to live in a global, interconnected society.

In World History II students expand their ability to think clearly and carefully about social and historical forces that have shaped the world. They compare the roles of different groups of people, including young people, in different times and places. They learn to think in an organized way to understand history and to express themselves in all forms of writing, both formal and informal.

This course assists students in the study of modern human history by posing the questions: What changes and events have caused people to live the way they do today? What progress have humans made? What problems still exist today? What solutions to these problems can individuals of today offer?

United States (U.S.) History

Advanced Placement, weighted 1.0 750100
Grade 11 Credit: 1
Prerequisite: None

SOL Test In AP U.S. History students expand their ability to think clearly and carefully about social and historical forces that have shaped their lives. They address questions such as: How did a nation whose Constitution first included the 3/5 Compromise eventually come to have an African-American President in 2012?

Students compare the roles of different groups of people, including young people, in different times and regions. Students continue to learn to think in an organized way to understand history and to express themselves in all forms of writing, both formal and informal.
In this class students are expected to develop their ability to use historical evidence to make arguments and draw conclusions and to improve their ability to think critically about the formation of the United States of America.

Students have the opportunity to take the AP U.S. History Exam in May with the possibility of earning college credit.

United States and Virginia History

Academic 750300
Grade 11 Credit: 1
Prerequisite: None

In U.S./Virginia History students expand their ability to think clearly and carefully about social and historical forces that have shaped their lives. Students compare the roles of different groups of people, including young people, in different times and regions. They learn to think in an organized way to understand history and to express themselves in all forms of writing, both formal and informal.

In this class students are expected to develop their ability to independently use historical evidence to make arguments and draw conclusions. This course helps students improve their ability to think critically while examining how the people of America have met needs, formed communities, and developed into new, diverse, and complex societies.

Combination United States Government and Comparative Government

Advanced Placement, weighted 1.0 762000
Grade 12 Credit: 1
Prerequisite: None

This course combines AP U.S. and AP Comparative Government. The College Board curricula for both courses have been woven together to make this one coherent, year-long course. Students who seek the 1.0 weight must pass the entire year-long course. Students are encouraged to take both the AP U.S. Government and the AP Comparative Government exams in May. All students are prepared for both exams.

In AP Government students expand their ability to think clearly and carefully about social and political forces that shape their lives. Concepts which are considered include life under a political system where people are “guilty until proven innocent” and what it would be like to have an election where each office had only one candidate; these are different interpretations of “democracy.” In this class, students study the principles of government in the U.S. and the institutions and laws used to make government work. They also compare US systems and laws to those of other countries so students can examine how different societies define “justice” and those societies’ notions of civil rights and civic responsibility.

Through the examination and comparison of government systems, students develop and improve their analytical skills, and they improve their ability to think in an organized way about very complex issues that involve many different types of people, groups, and institutions. Students also improve their communication skills since government is a social topic. Students’ analytical writing and active listening skills are significantly developed as they improve their ability to participate in political debate with fairness and respect for diverse perspectives.

Students have the opportunity to take the AP U.S. Government and Comparative Government Exams in May with the possibility of earning college credit.

United States/Virginia Government

Academic 760300
Grade 12 Credit: 1
Prerequisite: None

In U.S./Virginia Government students expand their ability to think clearly and carefully about social and political forces that shape their lives. They continue to develop their thinking in an organized way for clear communication in all forms of writing, both formal and informal. They strengthen their independent ability to describe and make conclusions about government structures and policies.

This course helps improve students’ ability to think critically and to examine how the people of America meet their needs for constructive political life in a diverse society. Democracy depends on citizens’ paying attention and getting involved. The course prepares students to be thoughtful and active citizens of the U.S.

Economics 782700
Grades 10-12 Credit: 0.5
Prerequisite: None

In this course, students discover that basic economic principles are at work in life every day, and an understanding of these principles helps them to make better economic choices.

Students also learn how governments and private financial institutions impact their economic choices by the decisions they make about “who gets what” in a world with scarce resources.

Beginning with the 9th grade that entered high school in 2011-2012, all students must take a one-semester course in Economics and a one-semester course in Personal Finance in order to graduate. This course fulfills the “Economics” portion of the one-year requirement for graduation.

Social Science and Global Studies Electives

Survey of African History 741210
Survey of African History—Dual Enrollment, weighted 0.5 NOVA 741200
Grades 11-12 Credit: 1
Prerequisite: None

Much of African history as people hear it consists of information beginning with when Europe began to interact with the continent of Africa, omitting much of the complete story of rich traditions, major events, and diverse cultures that stretch back far in time and across a huge land mass.

Students who want to learn about the history of this gigantic and diverse place and would like to look at history “through African eyes,” should select this course. Students should be prepared to read, discuss, and write. Successful completion of this course allows students to earn college credit offered through Northern Virginia Community College (NOVA).

This course may not be offered at all schools.
Survey of Latin American History 781100
Survey of Latin American History—Dual Enrollment, weighted 0.5 781000
Grades 11-12
Credit: 0.5
Prerequisite: None

Students wishing to fulfill the Economics and Personal Finance graduation requirement with this course must complete both AP components—Micro and Macro.

The microeconomic component of this AP course provides students with a thorough understanding of the principles of economics that apply to individual decision makers, both consumers and producers, within the economic system. The primary focus of the course is to help individuals develop an understanding of markets and the role the government plays in promoting greater efficiency and equity in the economy.

The macroeconomic component of this course provides students with a thorough understanding of the principles of economics as they apply to the economic system as a whole. This portion of the course focuses on national income and price-level determination and develops students’ familiarity with economic performance measures, the financial sector, economic growth and stabilization policies, and international economics.

In this course students are required to think critically about the complex issues surrounding a world with limited resources.

Students have the opportunity to take the AP Micro and Macro Economics Exams in May with the possibility of earning college credit.

Global Social Issues 775000
Grades 11-12
Credit: 0.5
Prerequisite: None

In Global Social Issues, students learn that the people on this planet have numerous differences, yet face issues and challenges that are connected. Issues that may seem to impact only one area may actually impact other people and societies across the globe.

In this course students study how humans behave and interact with each other. In some instances, people and nations work together on environmental concerns; and in others, people and nations work at cross-purposes on the environment. On other issues, such as women’s rights, students discover a wide spectrum of views and approaches according to a particular society’s culture and history.

Human Geography Advanced Placement, weighted 1.0 741100
Grades 11-12
Credit: 1
Prerequisite: None

AP Human Geography helps students analyze the world and their relationship to it. Students learn to look for geographic causes for events in different regions, to compare geographic features and their effects on human life, and see how their lives are connected to and affected by human and geographic conditions all over the globe. In this course students write, read, discuss, and present issues of global and local importance. Students also learn about an important tool for Human Geography: GIS software. AP Human Geography prepares individuals to be part of the solution to the challenges facing humanity on Earth in the 21st Century.

Students have the opportunity to take the AP Human Geography Exam in May with the possibility of earning college credit.

Logic I—Dual Enrollment, weighted 0.5 283100
Grades 11-12
Credit: 0.5
Prerequisite: None

This course introduces inductive and deductive reasoning and the basic methods of symbolic logic, with an emphasis on common errors and fallacies. The aim is to introduce the student to logic as the study of techniques used to distinguish correct from incorrect reasoning. Several methods of evaluating reasoning will be stressed. The basic distinction between inductive and deductive reasoning will be emphasized.

The major elements of content in this course are: the definition and analysis of arguments, various uses of language, informal fallacies in reasoning, categorical propositions and syllogisms, Venn diagrams, rules of syllogistic inference, and the application of all of these in the testing of arguments.

This course will be offered at the Loudoun campus of Northern Virginia Community College.

Logic II—Dual Enrollment, weighted 0.5 283200
Grades 11-12
Credit: 0.5
Prerequisite: None

This course evaluates deductive arguments utilizing methods of symbolic logic. Several methods of testing arguments for validity using symbolic logic will be stressed. The aim is to introduce students to contemporary symbolic logic. Several methods of testing arguments for validity using symbolic logic will be stressed.

The major elements of content in this course are: the nature of symbolic logic, the distinction between simple and compound truth-functional statements, the truth-tables which define conjunction, negation, disjunction, material implication and material equivalence. Also included are the applications of truth-tables, distinctions among tautologies, self-contradictions, contingent statements, the Rules of Inference including the Replacement Rules, and arguments, proofs, validity.

This course is offered at the Loudoun Campus of Northern Virginia Community College.
Modern International Relations 784700
Grades 11-12  Credit: 0.5
Prerequisite: None

In this course students examine the ways in which people and nations relate to each other and develop their own ideas about how the new global situation should be addressed. Students in this course must closely read and listen to the news, too, because people are moving and taking actions all the time in today’s world, and lives are affected by people or events from beyond the national borders.

This course assists students in learning how they can contribute to the solutions to international problems, and develop their own abilities to function on the increasingly interconnected globe.

Psychology 786700
Grades 11-12  Credit: 0.5
Prerequisite: None

Psychology provides students with ideas about how to address many questions regarding human behavior. Psychologists provide biological, emotional, and situational reasons as answers to questions about human behavior. By studying those reasons, students gain better understanding of why people do what they do and develop the ability to generate their own answers.

Psychology helps students think about human behavior in an organized way.

Psychology Advanced Placement, weighted 1.0  787100
Grades 11-12  Credit: 1
Prerequisite: None

Psychologists study all aspects of human behaviors—those humans have in common with animals and those humans do not and those that range from peace-making to the microscopic functioning of a nerve cell. Students become psychologists in this course and expand their minds to analyze human behavior in methodical, organized, large-scale, small-scale, inquiry-based approaches. Students need to work hard to read about, understand, write about, discuss, and explain the ways humans behave.

Class participants study how humans learn, how humans inherit traits from their parents, how humans act in groups, why humans have emotions, and how humans sometimes engage in behaviors that are destructive.

Students have the opportunity to take the AP Psychology Exam in May with the possibility of earning college credit.

The World of Ideas 741300
Grades 11-12  Credit: 0.5
Prerequisite: None

This course focuses on three main philosophical questions:

- Is there a purpose to life?
- What is the definition of a human being?
- How can human beings know anything for sure?

In this course students explore their answers to these questions by studying the answers given to them by a diversity of cultures and traditions across the globe.

Students in this course explore the world of ideas by taking this course and may develop some ideas about their place in the universe—or may generate many more questions that they would like to explore.

World Religions 741400
Grades 11-12  Credit: 0.5
Prerequisite: None

Teenagers of Aborigine heritage in Australia have traditionally gone through a “rite of passage” called a “Walkabout.” They are meant to have a spiritual awakening in the Outback by surviving in the desert without supplies, and without even clothing, for one to two weeks. Students’ own backgrounds may call for a “rite of passage” for them. Why do religions have “rites of passage” and other ceremonies? Why do they have different types of ceremonies?

In this course students explore questions like those above and examine and compare the practices, faiths, and literature of the major religions in the world today. They do so with readings, videos, creative and analytical writing, and discussion. The many beautiful, meaningful, and inspirational forms of religion in the world explain much about the world views and cultures of the diversity of people living on the globe today. Students who take this course improve their understanding of the people who share this planet with them.

Basic Skills 080040
Grades 9-12  Credit: 1.0
Prerequisite: None

Graded as Pass or Fail; not used in Cumulative Grade Point Average.

Basic Skills is an elective course for special education students receiving resource or self-contained services for a full period and who require more intensive work on identified needs as noted in their Individualized Education Plan (IEP).

Students are introduced to a variety of strategies and techniques to enable them to better achieve in school. Strategies and techniques may include time management, study skills, note taking, and self-advocacy, based on the student’s needs. The teacher may use one or more content areas (e.g., language arts, math, science) to teach students how to adapt these strategies and techniques to different situations.

Because this is a developmental course, Basic Skills may be retaken for credit each semester for up to four years.
### Career Pathways

**Grades 10-12**  
**Credit:** 1  
**Prerequisite:** None  

Career Pathways is an elective course for students with IEPs. The course focuses on goal setting and self-determination as they relate to transitioning from secondary to post-secondary life.  
Students develop skills necessary for post-secondary success through use of the Life Centered Career Education Curriculum. Students may participate in school-based or community work experiences as a part of this course.  
The course is taught based upon individual student needs and interests; therefore, it may be taken more than once for consecutive, elective credit.

### Personal Living and Finance*

**Grades 9-12**  
**Credit:** 1 elective credit*  
**Prerequisite:** Mathematics 8  

Personal Living and Finance is a course intended to help students prepare for the world of work. Practical applications are used throughout the course to provide real-world examples of computation. Simulations in the course include such topics as buying a car, renting an apartment, managing a budget, taxes, using credit wisely, investments, and insurance.  

*This course may be used to fulfill the mathematics requirements for a Modified Standard Diploma.

### Reading Workshop Strategies

**Strategies 1:** 101100  
**Strategies 2:** 101200  
**Strategies 3:** 101300  
**Strategies 4:** 101400  

**Grades 9-12**  
**Prerequisite:** None  

Reading Strategies is an elective course for students with IEPs who need specific instruction in reading and reading strategies. The course is taught based upon students’ individual needs.

### Aerospace Science I

(Formerly Aerospace Science)  
**Grades 10-12**  
**Credit:** 1  
**Prerequisite:** None  

Aerospace Science is a course designed to introduce students to the technologies of aeronautics and space sciences. The course is a study of the interrelationship between aeronautics and space science.  
Students use a hands-on approach to study concepts including aerodynamic principles, aircraft and spacecraft technologies, meteorology and space environments, commercial applications, administration, and historical perspectives. Field experiences expose students to career paths in the aerospace industry and governmental agencies.  

*This course counts as an elective credit.*

### Aerospace Science II

**Grades 11-12**  
**Credit:** 1  
**Prerequisite:** Aerospace Science I  

Aerospace Technology II provides an advanced exploration of flight, space travel, and supporting technologies through a problem-solving method and practical application. Students explore concepts in aircraft operations; aircraft design, flight safety and maintenance; airport infrastructure; rocket technology; space systems; and living and working in the aerospace environment. This course counts as an elective credit.  

*This course counts as an elective credit.*

### Materials and Processes

(Formerly Technology Education II)  
**Grades 9-12**  
**Credit:** 1  
**Prerequisite:** None  

Students focus on the industrial/technical materials and processes as they fabricate usable products and conduct experiments. Students explore and master multiple production materials including plastics, metals, woods, ceramics, and composites. Students explore the materials and the properties of each, investigate use of the materials in products, and experiment with the development of products, using the materials. Students are expected to follow strict safety requirements when elements of instruction take place in the Technology Education production lab. Virginia’s Workplace Readiness competencies are also emphasized.  

*This course counts as an elective credit.*

### Manufacturing Systems I

**Grades 10-12**  
**Credit:** 1  
**Prerequisite:** Materials and Processes  

This course provides an orientation to careers in various fields of manufacturing. Emphasis will be placed on manufacturing systems, safety, materials, production, business concepts, and the manufacturing process. Students participate in individual and team activities to create products that demonstrate critical elements of manufacturing. Students are expected to follow strict safety requirements when elements of instruction take place in the Technology Education production lab.  

*This course counts as an elective credit.*

### Manufacturing Systems II

**Grades 11-12**  
**Credit:** 1  
**Prerequisite:** Manufacturing Systems I  

Students develop an in-depth understanding of automation and its applications in manufacturing. Activities center on flexible manufacturing processes and computer integrated manufacturing (CIM). Students work in teams to solve complex interdisciplinary problems that stem from the major systems in automated manufacturing. Students are expected to follow strict safety requirements when elements of instruction take place in the Technology Education production lab.  

*This course counts as an elective credit.*

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**TECHNOLOGY EDUCATION**

**LOUDOUN COUNTY PUBLIC SCHOOLS**
Production Systems  
(Formerly Technology Education I)  \[851000\]  
Grade 12  
Credit: 1  
Prerequisite: Manufacturing Systems II

This course is designed to introduce students to the world of technology and design. Students explore the use of cutting-edge technology in production of goods. Economic and social implications are considered. Students move through the problem-solving process to plan an organization and production facility, design and produce a prototype, develop a marketing plan for the product, and evaluate potential success. Students are expected to follow strict safety requirements when elements of instruction take place in the Technology Education production lab. Virginia’s Workplace Readiness competencies are also emphasized.  
This course counts as an elective credit.

Technical Drawing and Design  
(Formerly Computer Aided Drafting & Design I)  \[853000\]  
Grades 9-12  
Credit: 1  
Prerequisite: None

Technical Drawing and Design provides the student with the basic principles and theories underlying graphic representations, which are common to all areas of industrial work. Learning units and required drawings emphasize the basic skills in computer assisted drawing (CADD) and related areas. Occupational information is also presented.  
This course counts as an elective credit.

Engineering Drawing and Design  \[853500\]  
Grades 10-12  
Credit: 1  
Prerequisite: Technical Drawing and Design

Students explore the engineering design process and use a graphic language for product design, technical illustration, assembly, patent, and structural drawings. They increase their understanding of drawing and the design process and techniques learned in the prerequisite course. Students use computers, calculators, and descriptive geometry and adhere to established standards to solve design problems.  
This course counts as an elective credit.

Architectural Drawing and Design  
(Formerly Computer Aided Drafting & Design II)  \[854000\]  
Grades 10-12  
Credit: 1  
Prerequisite: Technical Drawing and Design

This course is designed to give the college-bound student an opportunity to explore specific fields related to Computer Aided Drafting & Design. These areas are architectural, electrical, sheet metal, structural, topographical, and mechanical. The student then chooses areas of interest and pursues independent, in-depth studies.  
This course counts as an elective credit.

Advanced Drawing and Design  \[854500\]  
Grades 11-12  
Credit: 1  
Prerequisite: Engineering Drawing and Design OR Architectural Drawing and Design

Students use a graphic language for product design and technical illustration. They increase their understanding of drawing techniques learned in the prerequisite courses. They research design-related fields while identifying the role of advanced drawing and design in manufacturing and construction industry processes. They apply the design process, analyze design solutions, reverse engineer products, create 3-D solid models using CADD, construct physical models, and create multimedia presentations of finished designs. They complete a work portfolio based on a chosen graphic project.  
This course counts as an elective credit.

Technology Foundations  
(Formerly Applied Technology I)  \[856000\]  
Grades 9-12  
Credit: 1  
Prerequisite: None

Students acquire a foundation in technological material, energy, and information and apply processes associated with the technological thinker. Challenged by laboratory activities, students create new ideas and innovations, build systems, and analyze technological products to learn further how and why technology works. They work in groups to build and control systems using engineering design in the development of a technology. Technologies explored include Biotechnology, Communications, Construction, Manufacturing, Power and Energy, and Transportation.  
This course counts as an elective credit.

Technology Transfer  
(Formerly Applied Technology II)  \[857000\]  
Grades 10-12  
Credit: 1  
Prerequisite: Technology Foundations

Students work with a variety of computers, materials, and systems to improve their skills and knowledge. Groups work together, applying mathematics, science, and communication concepts on a project that combines systems such as production, energy, communication, transportation, biotechnology, and other technologies. Thematic activities engage students in community problems where they transfer the technological method to address recycling, space exploration, and housing.  
This course counts as an elective credit.

Technology Assessment  
(Formerly Applied Technology III)  \[858000\]  
Grades 11-12  
Credit: 1  
Prerequisite: Technology Transfer

Technology Assessment is offered as a capstone course for students in high school. Students use their knowledge and abilities in technology, mathematics, science, and other disciplines to analyze the impacts of technological devices and systems on the world. Students use information they acquire through activities and research to predict the future. They use computers and assessment activities to analyze products and systems to determine their possible impact. They design and present their newly created products or systems.  
This course counts as an elective credit.
AVID 1
Grade 9
Prerequisite: None
LCHS, PVHS, and THS Only
This course prepares students for entrance into colleges and universities. The course emphasizes critical reading strategies, analytical writing, collaborative discussion strategies, tutorial inquiry study groups, preparation for college entrance and placement exams, college study skills and test-taking strategies, note taking, and research. Students also develop time management and organization skills as part of the AVID 1 course.

AVID 2
Grade 10
Prerequisite: None; AVID 1 recommended
LCHS, PVHS, and THS Only
This course prepares students for entrance into colleges and universities. The course emphasizes critical reading strategies, analytical writing, collaborative discussion strategies, tutorial inquiry study groups, preparation for college entrance and placement exams, college study skills and test-taking strategies, note taking, and research. Students also investigate college and career options as part of the AVID 2 course.

AVID 3
Grade 11
Prerequisite: AVID 2
LCHS, PVHS, and THS Only
This course prepares students for entrance into colleges and universities. The course emphasizes critical reading strategies, analytical writing, collaborative discussion strategies, tutorial inquiry study groups, preparation for college entrance and placement exams, college study skills and test-taking strategies, note taking, and research. Students also investigate the college application process and develop a portfolio of sample college applications and sample essays.

AVID 4
Grade 12
Prerequisite: AVID 3
LCHS and PVHS Only
This course prepares students for entrance into colleges and universities. The course emphasizes critical reading strategies, analytical writing, collaborative discussion strategies, tutorial inquiry study groups, preparation for college entrance and placement exams, college study skills and test-taking strategies, note taking, and research. Students also finalize college application requirements, with a particular emphasis on investigating options for financial aid. In addition, students conduct and present a culminating research project.

Economics and Personal Finance
On-line Course (36 weeks)
823V00
Grades 10-12
Credit: 1
Prerequisite: None
Students will learn how to navigate the financial decisions they must face and to make informed decisions related to career exploration, budgeting, banking, credit, insurance, spending, taxes, saving, investing, buying/leasing a vehicle, living independently, and inheritance. Development of financial literacy skills and an understanding of economic principles provide the basis for responsible citizenship and career success. In addition to developing personal finance skills, students in the 36-week online course also study basic occupational skills and concepts in preparation for entry-level employment in the field of finance.
This course will be taught during the regular school day with an assigned teacher-facilitator. This course incorporates all economic and financial literacy objectives included in the Code of Virginia §22.1-200-03B. This 36 week course is a graduation requirement beginning with the class of 2015.

Personal Finance
825000
Grades 10-12
Credit: 0.5
Prerequisite: None
Students learn how to navigate the financial decisions they must face and to make informed decisions related to career exploration, budgeting, banking, credit, insurance, spending, taxes, saving, investing, buying/leasing a vehicle, living independently, and inheritance. Development of financial literacy skills and an understanding of economic principles provide the basis for responsible citizenship and career success.
In addition to developing personal finance skills, students also study basic occupational skills and concepts in preparation for entry-level employment in the field of finance.
The course incorporates all economic and financial literacy objectives included in the Code of Virginia §22.1-200-03B. This semester course is a graduation requirement beginning with the class of 2015.

SAT Preparation
071000
Grades 10-12
Credit: 0.5
Prerequisite: None
This course is designed to help students spend concentrated time and effort understanding the patterns and strategies needed to understand and prepare for the SAT Reasoning Test, a nationally standardized college admissions test.
Instruction focuses on the test design, practice, analysis of results, and instruction in areas of weakness. Three main areas of study include critical reading, mathematical reasoning, and writing.
The course is graded as a “pass”/“fail” elective, based on the student’s active participation in the class and completion of assignments.
Priority is given to seniors for the first semester and to juniors during second semester. Interested sophomores may have access if space permits.
The mission of the LCPS Academy of Science (AOS) is to provide an academic environment where students are encouraged to develop creative scientific endeavors of their own design while having the opportunity to pursue a rich, well-rounded high school experience. A student at AOS acquires the skills to ask sophisticated scientific questions and conduct research and experimentation; to explore the interconnections between the sciences, math, and the humanities; to read, write, and communicate at a level that is required of university students; and to develop perspectives to assess the impact of scientific advancements on society.

The cornerstone of science preparation is a 9th/10th grade integrated science program which blends the physical sciences of physics, chemistry, and earth science into a seamless, inquiry-based lab course in preparation for AP coursework. The goal of the lab program is student-designed investigations coupled to an in-depth writing/scoring rubric. In addition, sophomores begin instruction in basic research techniques to be followed by two years of research in a topic of their choosing. The math program offers courses from Algebra and Trigonometry through Multivariable Mathematics. All courses have a heavy component of statistics and modeling and are taught in terms of practical application in order to coincide with the science program.

AOS students are selected through an application process. Rising 9th grade students are invited to attend after a competitive process that evaluates test scores, academic achievements, writing samples, teacher recommendations, and self-reported interests and activities. Student motivation and interest in science are the most valuable characteristics of AOS students. Highly motivated students who are consistent, dedicated learners have the greatest chance of success.

Accepted students are required to enroll as full-time students in LCPS. Students attend AOS on alternating days, with the opposite day being spent at their home high school. Students are required to take specific classes at AOS in Grades 9 and 10, but begin to have choices including Advanced Placement (AP) classes in Grades 11 and 12. AOS students may elect to take additional AP math and science classes at the home school. All other content area classes are taken at the home school.

At a minimum, students must be enrolled in Algebra I during Grade 8 to be considered for admission to AOS. Geometry is also highly recommended; however, it may be completed during summer school prior to Grade 9 or 10.

Students planning on AOS should work closely with their counselors to develop a “Plan of Studies” which allows them to complete graduation requirements and plan for electives. Possible scheduling conflicts may necessitate the need to choose among options. Selecting a world language, such as Spanish, where many sections of advanced levels are offered helps reduce scheduling conflicts. Singleton electives may be impossible for AOS students to schedule at the home school every year. Some AOS students may not be able to enroll in every elective desired at the home school.

Interested students should visit the AOS homepage for the most current information concerning the application process: [www.lcps.org/aos](http://www.lcps.org/aos). District-wide information sessions and open house programs for prospective students are held prior to the application deadline.

The LCPS AOS, located at Dominion High School, opened in September, 2005, and expanded in September 2006 to include a program of studies for Grades 9 through 12. Loudoun County provides transportation for all students who attend AOS.

Any questions about AOS and the application process should be directed to the Academy of Science office, 571-434-4470.

### High School Plan of Studies for AOS Courses

<table>
<thead>
<tr>
<th>Grade 9</th>
<th>Grade 10</th>
<th>Grade 11</th>
<th>Grade 12</th>
</tr>
</thead>
<tbody>
<tr>
<td>AOS Integrated Science I &amp; Integrated Science II (Earth Science, Chemistry, Physics)</td>
<td>AOS Integrated Science III (students will take SOL for Earth Science &amp; Chemistry)</td>
<td>AOS Biology</td>
<td>AP Sciences (Chemistry, Biology, Physics, Environmental)</td>
</tr>
<tr>
<td>AOS Analytic Geometry, Functions, and Trigonometry with Transformations (Students take SOL for Algebra II)</td>
<td>AOS Analysis AB or AOS Analysis BC</td>
<td>AOS AB Calculus with Statistics or AOS BC Calculus with Statistics</td>
<td>AOS BC Calculus AP with Statistics or AOS Multivariable Calculus</td>
</tr>
<tr>
<td>AOS Sophomore Science Research</td>
<td>AOS Junior Science Research</td>
<td>AOS Senior Science Research</td>
<td></td>
</tr>
</tbody>
</table>
AOS Science Courses

AOS Integrated Science I, weighted 0.5 664900
Grade 9  Credit: 1
SOL Test: This course is the first in a series of integrated science courses (two-year sequence of courses) designed for AOS students. Students study the physical sciences, physics, chemistry, and earth science as an integrated progression of science topics and learn content typically taught in these courses. The course is inquiry-based with much of the content learned through laboratory exercises, some of which are student-designed. Students take the Earth Science and Chemistry SOL tests during the AOS Integrated Science course progression. AOS Integrated Science I, II, and III prepare students for the advanced study of physical sciences in the junior and senior years. This course is required for all AOS freshman.

AOS Integrated Science II, weighted 0.5 645900
Grade 9  Credit: 1
Co-requisite: AOS Integrated Science I
SOL Test: This course is the second in a series of integrated science courses (two-year sequence of courses) designed for AOS students. Students study the physical sciences, physics, chemistry, and earth science as an integrated progression of science topics and learn content typically taught in these courses. The course is inquiry-based with much of the content learned through laboratory exercises, many of which are student-designed. Students take the Earth Science and Chemistry SOL tests during the AOS Integrated Science course progression. AOS Integrated Science I, II, and III prepare students for the advanced study of physical sciences in the junior and senior years. This course is required for all AOS freshman.

AOS Integrated Science III, weighted 0.5 654900
Grade 10  Credit: 1
Prerequisite: AOS Integrated Science I and II
SOL Test: This course is the third in a series of integrated science courses (two-year sequence of courses) designed for AOS students. Students study the physical sciences, physics, chemistry, and earth science as an integrated progression of science topics and learn content typically taught in these courses. The course is inquiry-based with much of the content learned through laboratory exercises, many of which are student-designed. Students take the Earth Science and Chemistry SOL tests during the AOS Integrated Science course progression. AOS Integrated Science I, II, and III prepare students for the advanced study of physical sciences in the junior and senior years. This course is required for all AOS sophomore.

AOS Biology, weighted 0.5 652900
Grade 11  Credit: 1
The AOS Biology course is the next logical step for students who have spent two years in an integrated, inquiry-based science program. AOS Biology is a rigorous course preparing students for college level work. The approach of this course is a project/problem-based program where a scientific dilemma is posed to students; the students identify what they need to know in order to answer the question; the teacher leads them through the content they need in order to answer the question; and lab activities are relevant to the topic covered. Biology is a required class for AOS students in Grade 11. Students may select either AOS Biology or AP Biology. Students may also take these classes in a series: AOS Biology in Grade 11 and AP Biology in Grade 12.

AOS Sophomore Science Research, weighted 0.5 651900
Grade 10  Credit: 1
Prerequisite: AOS Integrated Science I and II
In this course students conduct a series of interdisciplinary science research activities designed to involve students in the application and use of inquiry-based methodology and to learn the use of techniques, equipment, and protocols typically used in scientific research laboratories. This course also enhances the ability of students to read and write scientific papers at the publication level. During the second semester, students begin work on a science research project of their own design that can be continued throughout their years as an AOS student. Sophomore Science Research is offered in conjunction with AOS Integrated Science III. This course is required for all AOS sophomores.

AOS Junior Science Research, weighted 0.5 661900
Grade 11  Credit: 1
Students continue to conduct interdisciplinary science research activities using inquiry-based methodology and increase their skill level with laboratory techniques and protocols in this course. This course also enhances the ability of students to read and write scientific papers at the publication level. Based on their interests, students begin to develop a research plan for an independent science research project that they complete in the Senior Science Research course. With a faculty mentor, they conduct a literature search, develop laboratory protocols, develop a materials list, create a budget, and work as a bench scientist. Regular presentation of results is an expectation for all research students. While it is intended that most of the bench-work can be conducted at AOS, some students interact with local scientists who act as mentors during both the school year and summer.

AOS Senior Science Research, weighted 0.5 671900
Grade 12  Credit: 1
In this course students continue to conduct interdisciplinary science research activities using inquiry-based methodology and increase their skill level with laboratory techniques and protocols. This course also enhances the ability of students to read and write scientific papers at the publication level. Students in Senior research continue their work on the plan created during the junior research course. They conduct their bench-work with the guidance of a faculty mentor. Regular presentation of results is an expectation for all research students. While it is intended that most of the bench-work can be carried out at AOS, some students interact with local scientists who act as mentors during both the school year and summer.
AOS Biology
Advanced Placement, weighted 1.0 664100
Grade 12 Credit: 1

This advanced course is a college-level, fast-paced course that follows the course outline of the College Board's AP Biology program. The course emphasizes cellular biology, biochemical processes of cellular respiration and photosynthesis, vertebrate anatomy and physiology, advanced genetics, evolution, plant anatomy and physiology, and ecology.

Students have the opportunity to take the AP Biology Exam in May with the possibility of earning college credit.

AOS Environmental Science
Advanced Placement, weighted 1.0 674100
Grade 12 Credit: 1

This advanced course is a college-level, fast-paced course in Environmental Science that follows the course outline of the College Board's AP Environmental Science program. The course includes field work and many extended lab procedures. The course emphasizes population biology; ecosystems; geologic and earth science concepts; atmospheric science; land and water use topics including energy and energy use, consumption, and conservation, and pollution; and global change.

Students have the opportunity to take the AP Environmental Science Exam in May with the possibility of earning college credit.

AOS Chemistry
Advanced Placement, weighted 1.0 669100
Grade 12 Credit: 1

This advanced course is a college-level, fast-paced course in Chemistry that follows the course outline of the College Board's AP Chemistry program. The course includes many extended lab procedures. In addition, such fields as organic chemistry, biochemistry, nuclear chemistry, coordination complexes, and semi-micro qualitative analysis are introduced.

Students have the opportunity to take the AP Chemistry Exam in May with the possibility of earning college credit.

AOS Physics
Advanced Placement, weighted 1.0 662100
Grade 12 Credit: 1

This course is a college-level, fast-paced course in that follows the course outline of the College Board's AP Physics program. Emphasis is placed on mechanics, and the student has the option to study additional topics. Pre-calculus and calculus skills are used to develop concepts and solve problems.

Students have the opportunity to take the AP Physics Exam in May with the possibility of earning college credit.

AOS Analytic Geometry, Functions, and Trigonometry with Transformations, weighted 0.5 541300
Grade 9 Credit: 1

This course begins with an introduction to transformations and matrices with a sampling of applications. This early work includes several topics in analytic geometry. The early work is then integrated into a study of the creation and interpretation of linear and quadratic models for data. The work with quadratics includes a transformations-based introduction to the complex number system. Transformation ideas are also applied to provide a full introduction to triangle trigonometry with applications. Modeling ideas are extended with the introduction of a variety of the families of exponential, logarithm, and power functions to describe patterns in a broader range of data sets. Criterion for testing the fit of models to data is explored. The overriding aim of this course is to help students focus on the difference between knowing how to perform special techniques and understanding the underlying mathematics so that the techniques can be applied in a variety of settings.

AOS Analysis AB, weighted 0.5 562000
Grade 10 Credit: 1

This course begins with the study of a family of probability density functions used to model the distribution of means computed from data collected from observations. At the same time students are introduced to the design of switching circuits. The work with these topics is followed by a second encounter with several families of functions used to model dynamic processes. The analysis is centered in applications from economics, demographics, medicine and physics. The work with modeling includes tools used to model patterns in rates of change. This is the setting for an introduction to derivatives with several relevant applications. This course prepares students to take an Advanced Placement Calculus course the following year.

AOS Analysis BC, weighted 0.5 562200
Grade 10 Credit: 1

This course includes all of the content of AOS Analysis AB. In addition students have their first experience with formal definitions of the core calculus concepts of continuity and differentiability and how those concepts are related. This course prepares students to take an Advanced Placement Calculus course the following year.

AOS AB Calculus with Statistics
Advanced Placement, weighted 1.0 561100
Grades 11-12 Credit: 1

This course covers all the topics in the College Board’s description of an AB level AP Calculus course. In addition, the students experience use of one or more differential equations to create models for a variety of dynamic processes of the types studied in the physical and biological sciences. After the AP exam in May, the students are introduced to classical methods of statistical inference.

Students have the opportunity to take the AP AB Calculus Exam in May with the possibility of earning college credit.
AOS BC Calculus with Statistics
Advanced Placement, weighted 1.0 571100
Grades 11-12 Credit: 1

This course covers all of the topics in the College Board's description of a BC level AP Calculus course. In addition, the students experience use of one or more differential equations to create models for a variety of dynamic processes of the types studied in the physical and biological sciences. After the AP exam in May, the students are introduced to classical methods of statistical inference.

Students have the opportunity to take the AP BC Calculus Exam in May with the possibility of earning college credit.

AOS Multivariable Calculus, weighted 0.5 583100
AOS Multivariable Calculus—
Dual Enrollment, weighted 0.5 583001
Grade 12 Credit: 1

This is a course in vector calculus. There is a special emphasis on using vector fields to model motion of particles and fluids in two and three dimensions. The software tool Mathematica is used throughout the course to create interactive graphics to enhance the meaning of calculations. In this context students discover methods for computing or approximating double and triple integrals. The work includes the use of the theorems of Gauss, Green, and Stokes to measure flow and turbulence.

AOS Multivariable Calculus with Topics from
Differential Equations, weighted 0.5 584100
AOS Multivariable Calculus with Topics from
Differential Equations—
Dual Enrollment, weighted 0.5 584001
Grade 12 Credit: 1

This course includes all the topics in the AOS Multivariable Mathematics. In addition the students write differential equations for a variety of oscillating motions including those with damping and exterior forcing. As they explore techniques for getting exact or appropriate solutions of these equations they will work with several techniques included in a first college level course in differential equations.
Students learn how to design, install, configure, operate, and troubleshoot simple and complex networks. Topics covered include network architecture (physical and logical), industry standards, protocols, network devices (such as routers, switches, and hubs), media selection, data transmission, and cabling.

Students in Network Administration should have entry-level competencies to include reading and expressing themselves in writing at the college level as well as solid algebra skills. Cisco requires an 80% or higher on any written tests and 100% on practical tests.

Students may obtain an Introduction to Telecommunications, Introduction to Copper Cabling, Leviton Structured Wiring, and Introduction to Fiber Optic certification through C-Tech. The C-Tech certification exam requires an 85% to meet certification requirements. Students study basic standards and proper manufacturing techniques used in the field.

Auto Collision Repair Technology I 867000
Grades 11-12 Credits: 3
Prerequisite: Competitive Application Process

This two-year course provides basic knowledge and skills in the use of shop materials, equipment, tools, procedures, and manuals in the auto body and auto refinishing fields.

Basic welding, aligning, roughing out, and replacing and refinishing (painting) of auto body sheet metal, plastics, urethane, and composites are among the skills taught in this course. Fundamentals of auto body repair estimating are also taught.

Students gain experience through theory and hands-on shop projects.

Auto Collision Repair Technology II 868000
Grade 12 or Post-Graduate Credits: 3
Prerequisite: Collision Repair Technology I

Students have the opportunity to develop their knowledge and skills through applied theory and hands-on shop projects using knowledge learned in Collision Repair Technology I.

Instructional topics include engine cooling systems, automotive circuits and wires, underbody measurement, and structural alignment.

Students explore career options such as auto collision repair technician, automotive refinishing technician, automotive parts specialist, detail technician, estimator, and insurance adjuster.

Upon successful completion of this course, students are prepared to perform many aspects of collision repair and qualify for sponsored apprenticeship programs.

Auto Servicing Technology I, weighted 0.5 NOVA 862000
Grades 11-12 Credits: 3
Prerequisite: Competitive Application Process

This is the first year of a two-year, 1200 hour program. This program provides the opportunity for students to develop the skills needed to follow environmental and safety practices and inspect, diagnose, adjust, and repair the systems of the modern technological automobile.

An industry standard curriculum, master-certified certified by the Automotive Service Excellence (ASE) and National Automotive Technician Educational Foundation (NATEF), provides the student the training format to proceed from the basic to advanced level technician in in brakes, steering and suspension, engine repair, and heating ventilation & air conditioning (HVAC).

Students can obtain ASE certification in these areas which is valid for two years from the date the test was passed. A dual enrollment agreement with Northern Virginia Community College allows qualifying students to earn one college credit for the SDV100 Student Development course.

Internship programs are available to students meeting certain criteria. Students can work with selected mentors at local dealerships or other auto servicing businesses.

This course is part of the Loudoun Governor’s Career and Technical STEM Academy.

Auto Servicing Technology II, weighted 0.5 NOVA 863000
Grade 12 or Post-Graduate
Prerequisite: Auto Servicing Technology I

This is the second year of a 1200-hour master NATEF accredited program. This program provides the opportunity for students to expand on the skills learned in the first-year program. Environmental and safety practices and inspections, diagnose, adjust, and repair the systems of the modern technological automobile.

An industry standard curriculum, master-certified by ASE (Automotive Service Excellence) and NATEF (National Automotive Technician Educational Foundation), provides the student the training format to proceed from the basic- to advanced-level technician in Electricity, Manual Drive train and Axle, Engine Performance, and Automatic Transmission.

Students can obtain ASE certification in these areas, which is valid for two years from the date the test was passed. A dual enrollment agreement with Northern Virginia Community College allows qualifying students to earn one college credit for the SDV100 Student Development course.

Internship programs are available to students meeting certain criteria. Students can work with selected mentors at local dealerships or other auto servicing businesses.

This course is part of the Loudoun Governor’s Career and Technical STEM Academy.

Biotechnology 885200
Grades 11-12
Prerequisite: Biology, Competitive Application Process

This one-year course introduces students to the world of biotechnology which is the use of living organisms or their products to modify human health and the human environment. Students explore many topics related to research, bioethics, forensics, health and medical fields, agriculture, environmental management, and many more. Students may study some topics related to their personal interests.

Through lab experiences in the greenhouse and off campus, students use a variety of laboratory equipment and become involved in research with the university and professional community through scientific inquiry and on-line mentorships. This Science, Technology, Engineering, and Technology (STEM) course is part of the Loudoun Governor’s Career and Technical STEM Academy program.
Building Construction I 865000
Grades 11-12  Credits: 3
Prerequisite: Competitive Application Process

In the first year of this two-year course, students acquire basic understanding of residential construction and the carpentry trade in addition to developing the skills to implement their acquired knowledge. The program also provides instruction on plan reading and comprehension.

Units of instruction include the completion of an Occupational Safety and Health Administration (OSHA) certification program and the study of structural components with emphasis on how they relate to each other, code, and to the finished product. This includes foundation work, floor and wall framing, interior and exterior finishes, and the construction and installation of cabinetry.

Computer-generated design programs (Solid Builder) and “Green Construction” techniques are emphasized in order to prepare students for advanced technologies in the field and essential environmental considerations.

Building Construction II 866000
Grade 12 or Post-Graduate  Credits: 3
Prerequisite: Building Construction I

Students expand their knowledge base with advanced skills, frequently working independently. They develop leadership skills by leading a crew of other students.

Students earn their OSHA 10 Card Certification and complete more in-depth work with areas of computer design and “Green Construction.”

Upon successful completion of this program, students are prepared to perform many aspects of building construction and are eligible for sponsored apprenticeship programs. The graduating students receive professional accreditation from the National Center for Construction Education and Research (NCCER) for their course work.

Computer & Digital Animation I, weighted 0.5 NOVA 839003
Grades 11-12  Credits: 3
Prerequisite: Competitive Application Process

Computer & Digital Animation I is an introductory course in digital content creation and animation. Students produce computer-generated models, characters, and animations using professional software. Students study the production pipeline from story idea to final render. The software used is from the Autodesk Entertainment Creation Suite. Covered software includes 3dsMax, Maya, Mudbox, Motionbuilder and Sketchbook Designer. Students create content suitable for TV, film, computer simulations, computer games, and architectural visualization.

Computer Integrated Engineering & Design (CIED)/Introduction to Engineering, weighted 0.5 NOVA
Grades 11-12  Credits: 3
Prerequisite: Competitive Application Process

CIED provides students with a foundation of skills needed for manufacturing and engineering in today's "high tech" workplace. The course focus is on hands-on, task-based activities where students learn and practice industrial and engineering skills.

Students follow a self-paced curriculum covering robotics, CADD/CAM, electrical systems, fluid systems, materials engineering, mechanical systems, quality assurance, computer control, solar photovoltaic installation, and wind turbine installation. Students are introduced to Solidworks, Mastercam and mill/lathe CNC programming. A solid understanding of basic algebraic operations is needed.

CIED gives students a jump start to pursue careers in engineering and engineering technology. Students who complete the course are prepared to take their skills to institutions of higher education or to related career fields.

This course is part of the Loudoun Governor’s Career and Technical STEM Academy. A dual enrollment agreement with Northern Virginia Community College allows qualifying students to earn 9 college credits.

Computer Systems Technology (CST)/Information Technology Essentials (ITE), weighted 0.5 NOVA 872000
Grades 11-12  Credits: 3
Prerequisite: Competitive Application Process

The CST/ITE program is a technical study of an array of topics offering fundamental knowledge regarding concepts, tools, and methods of Computer Systems Technology and Information Technology Essentials. The course consists of 5 courses that are dual enrolled with Northern Virginia Community College and students can acquire fifteen college credits by meeting specific requirements.

The curriculum concentrates on the student’s acquisition of theory, principles, competencies, practices, methodologies, tools, and technologies associated with the computer science and information technology profession. Students learn to apply problem-solving skills, techniques, ethical judgment, and critical thinking to assess the impact of information technology on social, political, and economic issues. Each student gains a broad background across essential areas of the information technology Industry through reading, studying, hands-on laboratory activities, E-books, virtual learning management systems, and industry collaboration.

Emphasis is placed on qualified students preparing for certifications and industry entry-level positions, and/or post-secondary studies in fields such as information security, information systems, telecommunications, and related information technology and computer science degrees. In addition to technical studies, students gain workplace readiness skills for effective written and oral communication with technical and non-technical language, as well as skills and strategies for facilitating group projects and
team activities. The course also explores an appreciation for the global impact of information technology (IT) on society and an understanding of the ethical and social responsibilities of IT professionals with emphasis on continued growth.

The iForCE program has recently been added to the curriculum. It is an online cyber security program, rich with video lectures, reading, virtual labs, quizzes and exams. Throughout the program students are equipped with the fundamental skills and certifications for entry-level employment in Cyber Security and compliance with DoDD 8570.1.

Students prepare for and take multiple profession industry validated certifications. Certification include; CompTIA A+, CompTIA Network+, CompTIA Security+ and Microsoft IT Academy certifications, Workplace Readiness Skills for the Commonwealth, OSHA and C-Tech into to Telecommunications. Some certifications require an exam fee that is paid by each student.

**Cosmetology I**

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<tbody>
<tr>
<td>11-12</td>
<td>3</td>
<td>Competitive Application Process</td>
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</table>

The first year of Cosmetology introduces students to the basics of shampooing and hairstyling, scalp treatments, hair cutting, finger waving, pin curling, roller techniques, chemical relaxing, permanent waving, hair coloring, facials, make-up, wig care, and manicuring. Related subjects include public health, personal hygiene, bacteriology, and salon management. Regular attendance is essential for success in this course. Students are required to purchase a cosmetology kit which includes items needed for the two-year program. **Lab Fees apply. (Kit fee as of 9/2014 is $185)**

In order to take the State Board of Cosmetology Licensing Examination, a student must successfully complete the program AND perform the required number of competencies in the lab AND present a U.S. Government-issued identification at the time of the Board exam. Passing the State Board Examination is required to be employed as a licensed cosmetologist. **Licensing Exam fee as of 9/2014 is $155.**

**Cosmetology II**

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<th>Grade</th>
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<tr>
<td>12 or Post-Graduate</td>
<td>3</td>
<td>Cosmetology I</td>
</tr>
</tbody>
</table>

Students are taught the advanced skills necessary to develop job entry requirements as a cosmetologist by performing the services expected in a professional salon environment. Advanced skills include hair cutting; chemical texture services; hair coloring, lightening, special effects hair color services and color removal application; hairstyling; thermal waving and pressing; artificial nail applications; and waxing services. Students also attain training in salesmanship, salon management and ownership, product knowledge, and public relations. Human anatomy and physiology, chemistry and electricity, diseases and disorders of the scalp, skin, and nails are also covered. Regular attendance is essential for completion of the required competencies needed for the State Board Exam. Students are expected to sit for the State Board Examination at the conclusion of Cosmetology II.

In order to take the State Board of Cosmetology Licensing Examination, a student must successfully complete the program AND perform the required number of competencies in the lab AND present a U.S. Government-issued identification at the time of the Board exam. Passing the State Board Examination is required to be employed as a licensed cosmetologist. **Licensing Exam fee as of 9/2014 is $155.**

**Culinary Arts I**

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<td>3</td>
<td>Competitive Application Process</td>
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</table>

This two-year program is designed to prepare students for employment in the fast-growing culinary industry or to continue with post-secondary training in such areas as culinary arts, baking and pastry, or restaurant management. Students complete units in the history of hospitality, safety, sanitation, equipment use, recipe production, management, serving the guest, and professionalism. Commercial methods of food storage, preparation, and handling are practiced. Skills are developed in the preparation of appetizers, soups, salads, meats, fruits, vegetables, breads, garnishes, and desserts. Students participate in both on-site and off-site catering events and meal service, and have many opportunities to use their creativity as they design and prepare food for service and display. Participation in culinary and hospitality competitions on the local, state, and national level is encouraged.

**Culinary Arts II**

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<td>3</td>
<td>Culinary Arts I</td>
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</table>

Students learn production and service skills used in the culinary industry. Nutrition, management skills, marketing, sustainability, and exploration of ethnic cuisines are emphasized. Students develop menus, food orders, and production schedules to be used while preparing and serving luncheons and special catered events. Technology is utilized to conduct nutritional analysis, menu planning, costing, and inventory control. Visits to local food service establishments are arranged, giving students the opportunity to observe first-hand the talents, responsibilities, and expectations of chefs, cooks, bakers, hospitality employees, caterers, and entrepreneurs. Those who successfully complete Culinary Arts I and II, a 400-hour mentorship program, and pass both the Level 1 and Level 2 ProStart exams will receive a ProStart certificate from the National Restaurant Association. Students complete in the ServSafe Food The certification counts as a “student choice” verified credit towards graduation. Students can also earn advanced standing at NOVA, Johnson and Wales, The Art Institute, and many other culinary schools.

**Emergency Medical Technician (EMT), weighted 0.5**

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<td>11-12</td>
<td>3</td>
<td>Competitive Application Process and must be 16 years of age prior to the first day of class and be affiliated with a volunteer fire or rescue department in Loudoun County</td>
</tr>
</tbody>
</table>

The EMT program is designed to provide training to individuals in order to function independently in a medical emergency and serve as a vital link in the chain of the health care team. This course includes all skills necessary to provide emergency medical care as an attendant-in-charge with a basic life support ambulance service or other specialized rescue service.
Environmental Plant Sciences, weighted 0.5
Grades 11-12

Prerequisite: Competitive Application Process

This one-year course focuses on plants as related to environmental responsibility. Topics include forestry, natural resource management and conservation, plant physiology, sustainable agriculture practices, landscaping and design, soil science, propagation, floral design. Indoor and outdoor labs reinforce texts.

This STEM course encourages students to interact with professors as well as government and industry professionals.

This is a Loudoun Governor's Career and Technical STEM Academy course. Eligible students who are dual-enrolled will earn 9 college credits along with 3 high school credits upon successful completion of this course. Additionally, industry certification may be acquired in the following: Virginia Nursery and Landscape Association as a Certified Horticulturist; Virginia Flower Growers Association as a Certified Greenhouse Operator; Virginia Department of Agriculture and Consumer Service as a Pesticide Technician.

Firefighter, weighted 0.5
Grades 11-12

Prerequisites: Competitive Application Process, must be 16 years of age prior to the first day of class and be affiliated with a volunteer fire or rescue department in Loudoun County.

During this one-year course, students are taught the Virginia Department of Fire Programs curriculum. Emphasis is placed on moving the new firefighter ahead to be more prepared and assume more of a leadership role within a department.

Instruction includes the proper use of personal protective equipment, maneuvering through dark and small areas, use of ladders, use of hoses and nozzles, techniques and equipment for the extinguishment of fires, fire behavior, basic hazardous materials operation/mitigation, and ropes/knots.

A combination of classroom study, scenarios, and modular practical experiences prepares students to carry out most fire ground functions under the direct supervision of an officer or experienced firefighter. Students learn to make basic evaluations of safety problems and assume leadership roles in conducting interior attack and search operations.

Graphic Communications I
Grades 11-12

Prerequisite: Competitive Application Process

This program is an introduction and investigation of variable topics in graphic design, computer graphics and visual communication principles, theory and practice. Various fundamental design philosophies and applications are examined as students work individually and collaborate in teams to design digital projects. Emphasis on concept driven projects include aspects of designs related to digital techniques of layout, typography and digital image/photo manipulation, digital illustration, layout, animation, and web design.

Construction and composition of finished work is created using a variety of interactive productivity software programs, books and various learning resources. The course includes safety standards related to equipment used, research, writing, text reading, discussions, oral presentations, lectures, specific project assignments, and design concept development in a time-based context. In addition, students learn workplace readiness skills of corporate, client-based and public service-based interactive design strategies.

Graphic Communications II
Grades 12 or Post-Graduate

Prerequisite: Graphic Communications I

This course covers advanced concepts and techniques of design utilizing interactive software to develop and compose a comprehensive professional portfolio. Curriculum includes contracts, copyright issues, interviewing skills, resume and cover-letter writing, design briefs and proposals, freelance business issues, as well as portfolio preparation and presentation. Portfolio presentation includes concepts learned in Graphic Communications I and Graphic Communications II. Under the guidance and supervision of faculty, students learn first-hand how to establish and run a creative design firm by working directly with clients, establishing and forecasting budgets and working within those budgets. In addition, students work with printers and press runs to meet real working deadlines.

Students compete in annual design/print competitive association activities and are given the opportunity to obtain PrintEd certifications; most graduates continue on to post-secondary education.

Heating, Ventilation, & Air Conditioning I (HVAC)
Grades 11-12

Prerequisite: Competitive Application Process

This course provides basic knowledge and skills in residential and commercial air conditioning, refrigeration, and heating.

Instruction includes basic electricity, safety, the physics of the refrigeration process, soldering and silver brazing, electrical components and controls, wiring diagrams, basic plumbing, sheet metal fabrication, and duct installation.

Heating, Ventilation, & Air Conditioning II (HVAC)
Grades 12 or Post-Graduate

Prerequisite: HVAC I

Students are provided advanced skills in residential and commercial air conditioning, refrigeration, and heating. The students learn to install, maintain, and repair heating and cooling equipment. Instruction includes air distribution and ventilation systems; refrigeration equipment; oil, gas, electric and heat pump systems; residential plumbing; and electrical layout and installation.

Upon successful completion of this course, students are prepared to perform most aspects of HVAC and qualify for sponsored apprenticeship programs. Students may be eligible to take the Environmental Protection Agency (EPA) Certification Exam, the Universal R-410 A Certification Exam, any or all of the 12 HVAC Excellence Exams, and the National Construction Career Test (NCCT).
This course introduces students to a vast array of careers within the health and medical professions. Students learn basic medical skills necessary to function safely and efficiently within the medical community. Career exploration allows students to make informed choices within related professions while preparing for future educational requirements.

Students are exposed to medical terminology; pharmacology; anatomy and physiology; and therapeutic and diagnostic interventions. Instruction also emphasizes professionalism, legal/ethical issues, and communication skills.

Students rotate through various medical settings for observational opportunities, connecting classroom knowledge with real-life experiences.

### Medical Laboratory Technology I

**Prerequisite:** NOVA 861000

**Credit Hours:** 3

This second year curriculum is designed to prepare students to gain foundational knowledge and skills appropriate for a variety of medical-related career paths in the field of medical laboratory technology. They are introduced to diagnostic laboratory procedures that support medical practice and research, and investigate safety, quality assurance, and ethical concerns associated with the field of laboratory medicine.

Medical laboratory disciplines studied include: Clinical Chemistry, Urinalysis, Clinical Hematology, Phlebotomy, and clinical laboratory biotechnology techniques. Students will have the opportunity to shadow in a professional setting as well as participate in organized field experiences. The opportunity exists for students to receive dual enrolled college credits for specific units of study.

### Medical Laboratory Technology II

**Prerequisite:** NOVA 861700

**Credit Hours:** 3

This second-year curriculum is designed to prepare students to become licensed nail technicians. Topics include health and safety issues, knowledge and chemistry of products, hand and foot anatomy, nail structure, diseases of the hands and feet, and career opportunities. Students learn basic and advanced skills in manicuring, pedicuring, hand and foot massage, nail tips, sculptured nails, nail wraps, nail art, and gel procedures. The curriculum also emphasizes salon management and ownership, marketing strategies, and job attainment competencies. In order to take the State Board Licensing Examination for Nail Technicians, a student must successfully pass the program and complete a required number of nail performances in the lab. Regular attendance is essential. Students are expected to purchase a nail kit at the beginning of the year. **Lab fees apply.**

Students are expected to sit for the State Board Examination which is required in order to obtain employment in the field. **Licensing Exam Fee as of 9/2014 is $155**

### Pharmacy Technology I

**Prerequisite:** NOVA 861300

**Credit Hours:** 3

This second-year curriculum is designed to prepare students to become certified Pharmacy Technicians who will assist pharmacists in a professional retail, compounding, closed-door, or hospital setting. Topics of study include technician duties; dosage forms; prescription containers and closures; generic substitution; information on prescription stock bottle labels; controlled substances; prescribers; receiving prescriptions, interpreting directions for use; calculations; patient interaction; federal privacy...

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**Introduction to Health and Medical Sciences, weighted 0.5**

**NOVA 861000**

**Grades 10-12**

**Credit Hours:** 3

**Prerequisites:** Competitive Application Process, Health Care Providers’ Current Immunization Record, Current (within last 3 months) 2-step PPD test, and Medical Insurance (private or school-purchased)

This course introduces students to a vast array of careers within the health and medical professions. Students learn basic medical skills necessary to function safely and efficiently within the medical community. Career exploration allows students to make informed choices within related professions while preparing for future educational requirements.

Students are exposed to medical terminology; pharmacology; anatomy and physiology; and therapeutic and diagnostic interventions. Instruction also emphasizes professionalism, legal/ethical issues, and communication skills.

Students rotate through various medical settings for observational opportunities, connecting classroom knowledge with real-life experiences.

**Medical Laboratory Technology I, weighted 0.5**

**NOVA 861200**

**Grades 11-12**

**Credit Hours:** 3

**Prerequisite:** Introduction to Health and Medical Sciences

This second year curriculum is designed to prepare students to gain foundational knowledge and skills appropriate for a variety of medical-related career paths in the field of medical laboratory technology. They are introduced to diagnostic laboratory procedures that support medical practice and research, and investigate safety, quality assurance, and ethical concerns associated with the field of laboratory medicine.

Medical laboratory disciplines studied include: Clinical Chemistry, Urinalysis, Clinical Hematology, Phlebotomy, and clinical laboratory biotechnology techniques. Students will have the opportunity to shadow in a professional setting as well as participate in organized field experiences. The opportunity exists for students to receive dual enrolled college credits for specific units of study.

**Medical Laboratory Technology II**

**Grade 12 or Post-Graduate**

**Credit Hours:** 3

**Prerequisite:** Medical Laboratory Technology I

Students build on the foundational knowledge and skills obtained in Medical Laboratory Technology I. The student uses the basic principles necessary to perform competently in the areas of Hematology, Clinical Chemistry, Clinical Microbiology, Immunohematology, and Immunology/Serology. Competency includes performing the technique correctly, understanding the theory of the procedures, and the proper interpretation of results. Weekly laboratories stress actual student performance of the routine tests normally seen in the clinical setting.

**Masonry**

**Grade 12 or Post-Graduate**

**Credit Hours:** 3

**Prerequisite:** Masonry I

Masonry is a two-year program that familiarizes students with various materials, tools, equipment, and practices of the masonry trade. The program helps students develop the skills and technical knowledge to lay concrete, block, brick, and ceramic tile.

Students also study blueprint reading and do labor and material estimates for residential and commercial projects. Students obtain an OSHA-10 certificate.

**Advanced Masonry**

**Grade 12 or Post-Graduate**

**Credit Hours:** 3

**Prerequisite:** Masonry I

Students advance their skills with concrete, block, brick, and ceramic tile. They complete various projects such as chimneys, fireplaces, sidewalks, and arches. They also learn repair and renovation work.

Stone masonry is included and prepares students to design and repair stone walls, fireplaces, sidewalks, and entryways.

Upon successful completion of this course, students are prepared to perform all aspects of masonry and qualify for sponsored apprenticeship programs.

**Nail Design Technology**

**Grade 12 or Post-Graduate**

**Credit Hours:** 3

**Prerequisite:** Competitive Application Process

This one-year program is available to juniors and seniors who wish to become licensed nail technicians. Topics include health and safety issues, knowledge and chemistry of products, hand and foot anatomy, nail structure, diseases of the hands and feet, and career opportunities. Students learn basic and advanced skills in manicuring, pedicuring, hand and foot massage, nail tips, sculptured nails, nail wraps, nail art, and gel procedures. The curriculum also emphasizes salon management and ownership, marketing strategies, and job attainment competencies. In order to take the State Board Licensing Examination for Nail Technicians, a student must successfully pass the program and complete a required number of nail performances in the lab. Regular attendance is essential. Students are expected to purchase a nail kit at the beginning of the year. **Lab fees apply.**

Students are expected to sit for the State Board Examination which is required in order to obtain employment in the field. **Licensing Exam Fee as of 9/2014 is $155**

**Pharmacy Technology I**

**Grade 12 or Post-Graduate**

**Credit Hours:** 3

**Prerequisite:** Introduction to Health and Medical Sciences

This second-year curriculum is designed to prepare students to become certified Pharmacy Technicians who will assist pharmacists in a professional retail, compounding, closed-door, or hospital setting. Topics of study include technician duties; dosage forms; prescription containers and closures; generic substitution; information on prescription stock bottle labels; controlled substances; prescribers; receiving prescriptions, interpreting directions for use; calculations; patient interaction; federal privacy...
requirements; the dispensing process; alternate drug delivery systems; sterile and non-sterile product compounding; pharmacy law, pharmacokinetics, and pharmacotherapy. Students have the opportunity to shadow in a professional setting as well as participate in organized field experiences.

Criteria for admission may be based on a pre-assessment for program placement. Upon initial acceptance the student must undergo or obtain specific immunizations, medical clearance, CPR certification, and a criminal background check for final acceptance into the program.

Pharmacy Technology II
Grade 12 or Post-Graduate
Prerequisite: Pharmacy Technology I

This third year of the certificate program is designed to provide students with the basic skills and knowledge to begin work as a pharmacy technician. The coursework fulfills the requirements of the Board of Pharmacy and prepares students to take either the state examination or the national examination administered by the Pharmacy Technician Certification Board. Trained, experienced pharmacy technicians who can demonstrate the right skills and knowledge should be able to pursue many exciting and respected career options or post-secondary study in the pharmacy field. Emphasis is placed on clinical field experiences and/or coordinated work-experiences as well as detailed pharmacotherapy, pharmacodynamics, and pharmacokinetics.

Practical Nursing (PN) I/
Certified Nurse Aide (CNA)

Grades 11-12
Prerequisites: Introduction to Health and Medical Sciences, Algebra, Biology, Competitive Application Process, Admissions Test. Chemistry is highly recommended. A lab fee is associated with this course.

Practical Nursing I is the first year of a two-year Practical nursing program that is accredited by the Virginia Board of Nursing. After successful completion of PN I the student may be admitted to PN II. After successful completion of both years the graduates are eligible to take the NCLEX-PN licensing exam and upon passing are able to work as a Licensed Practical Nurse (LPN). The PN I students are also eligible to take the Certified Nurse Aide exam after successful completion of PN I. Class units include geriatric nursing, nursing skills, nutrition, growth and development, nursing fundamentals, administration of medication, and anatomy and physiology. There is also a required 40-hour clinical experience at a long term care facility. Rising juniors and seniors and qualified adults who meet admission requirements are eligible to apply. It is a competitive application process. Criteria for admission include a satisfactory score on an admission test, satisfactory attendance, three references, and high school grades or diploma. A high school GPA of at least 2.0 is required. All students must be able to provide their own transportation to clinical experiences. Upon initial acceptance, the student must obtain specific immunizations, medical clearance, CPR certification, and criminal background checks. Most requirements must be met by the first day of the school year for final placement in the program. The Virginia Board of Nursing requires a social security number to take the licensing exam to become a licensed practical nurse. Applications to the school of Practical Nursing are accepted from January 1 to March 31 of each school year. Applicants must call the Practical Nursing secretary at 571-252-2082 after January 2 to schedule the Admission test date. The fee for this test is due on the day of the test. The Nursing program application and more information is available on the Practical Nursing site, under “Programs” at www.lcps.org/mtc.

Practical Nursing II
Grade 12 or Post-Graduate
Prerequisites: Practical Nursing (PN) I; a lab fee is associated with this course.

Practical Nursing II is the second year of a two-year practical nursing program that is accredited by the Virginia Board of Nursing. After successful completion of PN I the student may be admitted to PN II. After successful completion of both years the graduate is eligible to take the NCLEX-PN licensing exam and upon passing is able to work as a Licensed Practical Nurse (LPN). The LPN works in all healthcare settings under the direction of a medical doctor or a registered nurse. The job outlook for the LPN is strong and in demand. LPNs often continue their education to become a Registered Nurse (RN) or similar health care provider.

Class units taught are medical and surgical nursing, mental health nursing, obstetrical and neonatal nursing, pediatric nursing, advanced nursing skills, and professional issues. The students have a rigorous schedule of 16 hours a week of classroom instruction and 16 hours a week of clinical experiences. During clinical time the students give direct patient care under the supervision of the clinical instructors. Clinical experiences are at a hospital and at doctors’ offices. All students must provide their own transportation daily to all clinical sites and to the school. Background checks and medical clearance are required prior to the start of clinical rotations. More information is available on the Practical Nursing site, under “Programs” at www.lcps.org/mtc.

Radiology Technology I, weighted 0.5
NOVA
Grade 11-12
Prerequisite: Introduction to Health and Medical Sciences

The course informs students early in their study of what they can expect from a career in radiologic technology, requirements for certification, options for advancement, and what is required of them as allied healthcare workers. The student develops an understanding of the radiographer as a central member of the health care team and a valuable assistant to the radiologist.

This second-year curriculum is designed to prepare the student to understand the anatomy and physiology assessed in diagnostic images of the human body. The student develops an understanding of the safe use of radiation within the medical field. Additional topics of study include the history of the radiological profession, medical ethics, concepts of imaging, radiobiology, radiation protection, and the future of radiologic technology careers. Students may have the opportunity to shadow in professional settings.

Understanding of the material is developed through the use of lectures, group discussions, collaborative games and projects, coloring activities, review of actual radiographic examinations, and visits to imaging facilities.
Radiology Technology II
Grade 12 or Post-Graduate
Prerequisite: Radiology Technology I

Radiology II is intended for post-graduate students who are continuing their studies to prepare for acceptance into a Joint Review Committee on Education in Radiologic Technology (JRCERT) accredited program. This course content is developed through extensive independent study projects and regular forum meetings. The course content is delivered via the Loudoun Vision course management system. Students assist with radiology labs twice monthly. Finally, students are expected to engage in volunteer practices within a healthcare setting.

Students develop an understanding of the biological and technical factors involved in medical imaging. Emphasis is placed on the physics of medical imaging equipment and the effect of medical radiation on biologic tissue.

Students learn to apply radiation protection procedures for patients and medical imaging personnel. In addition, students expand their understanding of patient care within the radiology department to include assessment of vital signs, immobilization techniques for imaging, safe use of oxygen and pharmacologics during imaging procedures, use of sterile techniques, and evaluation of medical emergencies.

Veterinary Science
885400
Grades 11-12
Competitive Application Process
Credits: 3

This one-year course orients the student to Veterinary Science, covering topics such as anatomy and physiology, terminology, safety and sanitation, parasitology, posology, animal nutrition, breeds, professional conduct, office management, and emerging technologies in animal agriculture. Students are involved in performing clinical exams, conducting laboratory and hospital procedures and handling animals coordinated with area veterinary clinics and hospitals. Students frequently travel to off-campus sites. Student visits include these sites: M.A.R.E. Center, Cornwall Medical Lab, Marion DuPont Equine Hospital and other Veterinary Hospitals in the area. Students are members of FFA, (Future Farmers of America Club). Lab fees apply.

Welding I
896000
Grades 11-12
Competitive Application Process
Credits: 3

This two-year course consists of instruction in the set up and safe operation of Oxy-fuel Welding and Cutting, Plasma Arc cutting, Shielded Metal Arc and beginning GMAW welding processes. Students are trained in welding, cutting, and brazing.

Instructional topics include Shielded Metal Arc welding, plate in all position, pipe, and GMAW all position. Class activities provide instruction in art and ornamental welding, preparation for the American Welding Society (AWS) Test, and construction and repair of metal projects. AWS testing is at the student's expense.

Welding II
897000
Grade 12 or Post-Graduate
Welding I
Credits: 3

Emphasis in this course is on Shielded Metal Arc Welding in the horizontal, in all position, and pipe. Students have the opportunity to practice for the AWS’s Limited and Unlimited Welding Thickness Test. Welding certification options are available. Advanced work on the MIG and TIG processes is included.

Upon successful completion of this course, students are prepared to perform many aspects of welding and qualify for sponsored apprenticeship programs.

Television Production I/Digital Filmmaking I
893000
Grades 11-12
Competitive Application Process
Credits: 3

Prerequisite: Competitive Application Process

Camera operation, news reporting, non-linear editing, scriptwriting, audio production techniques, production planning, the business of video production, studio and control room operation, basic marketing, and production techniques are all a part of the first year of Television Production/Digital Filmmaking. The program is designed to have students complete the full competencies listed by the Virginia Career and Technical Education standards and to prepare students to obtain jobs in the video production industry.

Students use a wide range of professional equipment and produce projects that are viewed by the public. Students receive hands-on training with advanced computer effects, computer editing, professional camera equipment, and complex audio production. Students are encouraged to begin the program as juniors; however, if qualified, they may complete the second year as post-graduates.

Television Production II/Digital Filmmaking II
894000
Grade 12 or Post-Graduate
Television Production I
Credits: 3

The second year offers students more advanced editing opportunities and more complex productions. Special productions are created in a team setting as well as individually. Much of the production is in real-world settings for clients who wish public viewing of completed projects. Students use a wide range of professional equipment and produce projects that are viewed by the public. Students receive hands-on training with advanced computer effects, advanced computer editing, professional camera equipment, and complex audio production.
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### NAVAL JUNIOR RESERVE OFFICERS TRAINING CORPS (NJROTC)

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### SCIENCE

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