# Virginia Board of Education Agenda Item

**Agenda Item:** I. **Date:** May 24, 2012

| | | | |
|---|---|---|---|
| **Title** | Final Review of a Proposal from Fairfax County Public Schools to Establish the New Commonwealth Governor's STEM Academy at Chantilly High School and Chantilly Academy | | |
| **Presenter** | Joan E. Ozdogan, Career Experience Specialist, Chantilly High School and Chantilly Academy<br>Lolita B. Hall, Director, Office of Career and Technical Education Services | | |
| **E-mail** | jeozdogan@fcps.edu<br>lb.hall@doe.virginia.gov | **Phone** | (703) 222-7464<br>(804) 225-2051 |

**Purpose of Presentation:**
Other initiative or requirement. Specify below:
Final review and acceptance of the Proposal to Establish the New Commonwealth Governor's STEM Academy at Chantilly High School and Chantilly Academy, Fairfax County Public Schools.

**Previous Review or Action:**
First Review: April 26, 2012
Item was accepted for first review.

**Action Requested:**
Final Review: Action requested at this meeting
Date: May 24, 2012

**Alignment with Board of Education Goals: Please indicate (X) all that apply:**

| | |
|---|---|
| X | Goal 1: Expanded Opportunities to Learn |
| | Goal 2: Accountability of Student Learning |
| | Goal 3: Nurturing Young Learners |
| | Goal 4: Strong Literacy and Mathematics Skills |
| | Goal 5: Highly Qualified and Effective Teachers and Administrators |
| | Goal 6: Sound Policies for Student Success |
| | Goal 7: Safe and Secure Schools |
| | Other Priority or Initiative. Specify: Governor's STEM Academy |

**Background Information and Statutory Authority:**
Goal 1: The Governor's STEM Academy is designed to expand opportunities for the general student population to acquire STEM literacy and other critical skills, knowledge, and credentials that will prepare them for high-demand, high-wage and high-skill careers.

Partnerships establishing academies must include at least one public school division, business and industry, and postsecondary education. On November 29, 2007, the Board of Education approved the criteria to establish a Governor's STEM Academy. Subsequently, on March 19, 2008, the Board

approved the standards for the Governor's Career and Technical Education Exemplary Standards Awards Program, which all Career and Technical Academies must implement.

As required by the Board of Education, the State Council of Higher Education for Virginia (SCHEV) has reviewed the attached proposal and recommends that the Board approve the proposal. Staff members of the Virginia Department of Education (DOE) have also reviewed the proposal in the context of the Board's criteria. An executive summary of the proposal is in Attachment A. Attachments B and C are the reports from the reviews by SCHEV and the DOE. Attachment D is the complete proposal.

Currently, there are ten Governor's STEM Academies in Virginia. They are located in Arlington County, Chesterfield County, Halifax County, Hampton City, Loudoun County, Richmond City, Russell County, Stafford County, Suffolk City, and Carroll County.

**Summary of Important Issues:**
The proposal for the New Commonwealth Governor's STEM Academy at Chantilly High School and Chantilly Academy is conceptualized with partnerships consisting of Fairfax County Public Schools, Northern Virginia Community College, Dulles Regional Chamber of Commerce, Inova Health System, Lockheed Martin Corporation, Micron Technology, Inc., Norfolk State University, Old Dominion University, and Orbital Sciences Corporation.

The New Commonwealth Governor's STEM Academy at Chantilly High School and Chantilly Academy will focus on two career pathways: *Engineering and Technology* and *Network Systems*. Students will be provided STEM-enriched technological skills and knowledge necessary to succeed in postsecondary education and in the world of work through authentic, rigorous, project-based work while building partnerships with parents, community and business leaders to meet these goals.

The first pathway, *Engineering and Technology* is in the Science, Technology, Engineering, and Mathematics (STEM) Cluster. Students will examine technology and engineering fundamentals related to solving real-world problems. They will gain a basic understanding of engineering history and design, using mathematical and scientific concepts through hands-on projects in a laboratory setting as they communicate information in team-based presentations, developing proposals and writing technical reports. Students will be exposed to a variety of engineering fields such as Aeronautical Engineering, Architectural Engineering, Automotive Engineering, Bioengineering and Biomedical Engineering, Civil Engineering, Computer Engineering, Construction Engineering, Electrical Engineering, Electromechanical Engineering, Environmental Engineering, Industrial Engineering, Manufacturing Engineering, Mechanical Engineering, Surveying and Geomatics Engineering, and related career choices that will prepare them for postsecondary education.

The second pathway, *Network Systems* is in the Information Technology Cluster. Network Systems connect people and information. Students will learn how to design, install, maintain, and manage network systems for businesses and various other facilities. This pathway requires a solid foundation in mathematics and science as well as high technical skills. Students will have an opportunity to research and learn about energy conservation technologies and practices increasing the efficiency of energy distribution and use such as smart-grid technology. Information Technology workers can be found in virtually every sector of the economy and provide assistance on a multitude of levels.

**Impact on Fiscal and Human Resources:**
Funding must be provided at the local level.

**Timetable for Further Review/Action:**
The proposed beginning date for the New Commonwealth Governor's STEM Academy at Chantilly High School and Chantilly Academy, Fairfax County Public Schools, is fall of 2013.

**Superintendent's Recommendation:**
The Superintendent of Public Instruction recommends that the Board of Education approve the proposal to establish the New Commonwealth Governor's STEM Academy at Chantilly High School and Chantilly Academy, Fairfax County Public Schools.

# New Commonwealth Governor's STEM Academy
# at
# Chantilly High School and Chantilly Academy
# Executive Summary
# April 9, 2012

| | |
|---|---|
| Partnership Members: | Fairfax County Public Schools; Northern Virginia Community College, Dulles Regional Chamber of Commerce, Inova Health System, Lockheed Martin Corporation, Micron Technology, Inc., Norfolk State University, Northrop Grumman Information Systems, Old Dominion University, Orbital Sciences Corporation, SRC Inc., The SI Organization, and Virginia Manufacturers Association. |
| Lead Entity: | Chantilly High School and Chantilly Academy |
| Fiscal Agent: | Fairfax County Public Schools |
| Contact Person: | Ms. Joan E. Ozdogan<br>Career Experience Specialist<br>703 222-7464<br>jeozdogan@fcps.edu |
| Academy Location: | New Commonwealth Governor's STEM Academy<br>4201 Stringfellow Road<br>Chantilly, VA 20151 |
| Number Students: | The Governor's STEM Academy will have the capacity to enroll 1,500 students, grades 9–12. During the initial school year (2013-2014) enrollment will be offered to 1,300 students. |
| Career Pathways: | Engineering and Technology<br>Network Systems |
| Academy Goals and Description: | The overall goals of the Governor's STEM Academy are to provide students with the 21st-century, STEM-enriched technological skills and knowledge necessary to succeed in postsecondary education and in the world of work through authentic, rigorous, project-based work while building partnerships with parents, community and business leaders to meet these goals.<br><br>Specific Governor's STEM Academy objectives include:<br>• Improve academic achievement of Academy students by increasing academic rigor and relevance within selected pathways.<br>• Increase dual enrollment courses; offerings and completion rates.<br>• Provide workplace readiness experiences through strong partnerships with industry and government. |

- Increase high school graduation rates.
- Reduce dropout rates.
- Increase enrollment and retention in postsecondary education.
- Increase the number of students completing a college and workplace readiness curriculum in high school.
- Reduce the number of students requiring remediation in college.
- Increase the number of industry certifications awarded to high school students.
- Increase the number of graduates employed in high-wage, high-skilled careers.

Highlights of the Program:

As a result of participating in the Governor's STEM Academy in the pathways of Engineering and Technology and Network Systems students will:

- Gain a deeper understanding of the skills and knowledge incorporated in their fields of study;
- Benefit from specialized, project-based courses which develop critical-thinking, problem-solving, and decision-making skills, preparing them for the 21st-century world;
- Acquire effective communication skills;
- Develop relevant workplace readiness skills;
- Receive opportunities to earn industry certifications preparing them to be more competitive in the work force and when applying to advanced training schools or postsecondary institutions;
- Obtain meaningful, real-life, hands-on experiences in their career pathway; and
- Profit from opportunities for internships, mentorships, job shadowing, and cooperative education, which provide students with advantages when entering postsecondary education and/or the workplace.

Attachment B

# The State Council of Higher Education for Virginia

## Review of Governor's STEM Academy Proposal

Name of Lead Entity on Proposal: Chantilly High School and Chantilly Academy

Date of Review: 4-16-2012

The State Council of Higher Education for Virginia recommends approval of the: New Commonwealth Governor's STEM Academy at Chantilly High School and Chantilly Academy

Peter Blake
Director
State Council for Higher Education

4/15/12
Date

# Virginia Department of Education
# Governor's STEM Academy
# Proposal Review Checklist

**Title of Proposal: The New Commonwealth Governor's STEM Academy at Chantilly High School**

**Lead Entity for Proposal: Chantilly High School Academy, Fairfax County Public Schools**

**Date of Review: April 5, 2012**

# Virginia Department of Education
# Governor's STEM Academy
# Proposal Review Checklist

## I. Partnership Capacity

**Partnerships desiring to implement a Governor's STEM Academy shall provide the Department of Education with evidence of the following:**

| Criteria | Documentation | | | Comments |
|---|---|---|---|---|
| | Full | Partial | None | |
| A. An active, ongoing planning committee, including a list of members and signed certifications from each that they are willing and able to serve in that capacity. At a minimum, members must represent K-12 education (superintendent or designee), higher education, and business and industry. All partners must be represented on the committee. | X | . | | . |
| B. An advisory committee, including a list of members and signed certifications from each that they are willing and able to serve in that capacity. | X | | | |
| C. A written memorandum of agreement among school divisions, local businesses, postsecondary institutions, and any other partners that outlines ways in which community resources will contribute to the Governor's STEM Academy to broaden the scope of students' educational experiences. | X | | | |
| D. A statement of assurances that the Governor's STEM Academy Planning Committee has reviewed provisions of *Administrative Procedures Guide for the Establishment of Governor's STEM Academies* and agrees to follow the guidelines set forth in the document (see appendix). | X | | | |

| Criteria | Documentation | | | Comments |
|---|---|---|---|---|
| | Full | Partial | None | |
| E. A statement of assurances that, if applicable, an ongoing Governing Board will be established to reflect current Board of Education regulations relative to jointly operated schools and programs (see appendix). | | | | NA |
| Comments: | | | | |

## II. Need/Rationale for the Academy

**Partnerships desiring to implement a Governor's STEM Academy shall provide the Department of Education with evidence of the following:**

| Criteria | Documentation | | | Comments |
|---|---|---|---|---|
| | Full | Partial | None | |
| A. Demonstration of the need/rationale for the Academy. This statement should be concise and state the major reasons to have a Governor's STEM Academy, including need at the state, local and/or regional levels. | X | | | |
| B. A description of the enhanced or additional offerings in science, technology, engineering, and/or mathematics (STEM) that will meet the need described above. | X | | | |
| C. A fiscal agent that is a public entity, including a certification that the entity is willing and able to serve in that capacity. | X | | | |
| Comments: | | | | |

## III. Program Description

**Each Governor's STEM Academy planning committee shall develop cooperatively with local school divisions, business, community, and higher education partners and have available for review and dissemination, a program description that includes:**

### A. A statement of program goals addressing the following criteria:

| Criteria | Documentation | | | Comments |
|---|---|---|---|---|
| | Full | Partial | None | |
| 1. Rigorous academic content in career and technical instruction; | X | | | |
| 2. An emphasis on STEM career pathways; | X | | | |
| 3. Individualized high school plans to ensure course selections that are aligned with students' transition and career goals after high school; | X | | | |
| 4. Evidence that graduates will complete a college and work readiness curriculum, minimally at the level specified for Commonwealth Scholars Course of Study (State Scholars Core) with the possibility of pre-approved substitution of equivalent courses where there may be more relevant course selections for a particular career pathway; | X | | | |
| 5. Evidence that graduates will qualify for the Technical and/or the Advanced Technical Diplomas; and | X | | | |
| 6. Incorporation of Virginia's Workplace Readiness Skills. | X | | | |
| Comments: | | | | |

## B. A statement of program objectives and performance measures to:

| Criteria | Documentation | | | Comments |
|---|---|---|---|---|
| | Full | Partial | None | |
| 1. Improve academic achievement of Academy students; | X | | | |
| 2. Increase completion of dual enrollment courses; | X | | | |
| 3. Provide workplace readiness experiences for students through strong partnerships with businesses; | X | | | |
| 4. Increase high school graduation rates; | X | | | |
| 5. Reduce dropout rates; | X | | | . |
| 6. Increase enrollment and retention in postsecondary education; | X | | | |
| 7. Increase the proportion of students completing a college and workplace ready curriculum in high school; | X | | | |
| 8. Reduce the proportion of students requiring remediation in college; | X | | | |
| 9. Increase the number of industry certifications awarded to high school students; and | X | | | |
| 10. Increase the number of graduates employed in high-wage, high-demand and high-skill careers. | X | | | |
| Comments: | | | | |

## C. A brief description of the proposed program, including:

| Criteria | Documentation | | | Comments |
|---|---|---|---|---|
| | Full | Partial | None | |
| 1. Site location; | X | | | |
| 2. Number of students to be served; | X | | | |
| 3. Grade levels; | X | | | |
| 4. General curriculum design; | X | | | |
| 5. List of courses to be delivered; | X | | | |
| 6. Description of how/where the courses will be delivered. Courses may be delivered on a high school, technical center or community college campus, online, or in other innovative ways. | X | | | |
| 7. Designation of full-day or part-day, academic-year program. | X | | | |
| Comments: | | | | |

## D. Evidence of participation in the Governor's Exemplary Standards Award Program for STEM Education

| | Documentation | | | Comments |
|---|---|---|---|---|
| | Full | Partial | None | |
| | X | | | . |
| Comments: | | | | |

## E. Program and course descriptions

## E.1. At least two well-articulated career pathways must be included that meet the following criteria:

| Criteria | Documentation | | | Comments |
|---|---|---|---|---|
| | Full | Partial | None | |
| **Pathway #1** | | | | |
| a. Must include opportunities to earn industry credentials, postsecondary certificates, diplomas or associate degrees while in high school and pursue additional industry credentials and academic degrees at the associate, bachelor's and graduate levels. These pathways may be in the same or different career clusters. | X | | | |
| b. Must be in a field identified by a statewide authority or organization, such as the Virginia Economic Development Partnership or the Virginia Research and Technology Advisory Commission, as a strategic growth area for Virginia. Examples include biosciences, information technology, automotive technology and motor sports, as well as modeling and simulation and nanotechnology **or** | X | | | |

| Criteria | Documentation | | | Comments |
|---|---|---|---|---|
| | Full | Partial | None | |
| c. Must address regional and local work force demand in a high-wage, high-skill field as identified by employers and work force officials. | X | | | |
| d. At least one pathway must be in a STEM-related field. This career pathway should drive the innovative capacity of the region and/or state. | X | | | |
| **Comments:** | | | | |

| Criteria | Documentation | | | Comments |
|---|---|---|---|---|
| | Full | Partial | None | |
| **Pathway #2** | | | | |
| a. Each career pathway must include opportunities to earn industry credentials, postsecondary certificates, diplomas or associate degrees while in high school and pursue additional industry credentials and academic degrees at the associate, bachelor's and graduate levels. These pathways may be in the same or different career clusters. | X | | | |
| b. Must be in a field identified by a statewide authority or organization, such as the Virginia Economic Development Partnership or the Virginia Research and Technology Advisory Commission, as a strategic growth area for Virginia. Examples include biosciences, information technology, automotive technology and motor sports, as well as modeling and simulation and nanotechnology, or | X | | | |

| Criteria | Documentation | | | Comments |
|---|---|---|---|---|
| | Full | Partial | None | |
| c. Must address regional and local work force demand in a high-wage, high-skill field as identified by employers and work force officials. | X | | | |
| d. Of the two pathways described, at least one must be in a STEM-related field. This career pathway should drive the innovative capacity of the region and/or the state. | X | | | |
| e. Additional career pathways may address one of the areas described above, or an area identified by the partnership as an area of interest, growth, or expansion for students in the service area of the Academy. | X | | | |
| Comments: | | | | |

## E.2 List of all requirements for successful program completion.

| | Documentation | | | Comments |
|---|---|---|---|---|
| | Full | Partial | None | |
| | X | | | |
| Comments: | | | | |

## E.3 Academy graduates must achieve one or more of the following benchmarks:

| Criteria | Documentation | | | Comments |
|---|---|---|---|---|
| | Full | Partial | None | |
| a. Earn one or more industry certifications or state occupational licenses, and/or demonstrate competencies on an assessment instrument recognized by postsecondary institutions such as CLEP examinations, collaboratively designed or mutually approved end-of-course tests, college placement tests, or student portfolios reviewed by a team of college and high school faculty; **or** | X | | | |
| b. Earn at least 9 transferable college credits as defined in the Early College Scholars program (includes dual enrollment, AP and other options); **or** | X | | | |
| c. Earn an Associate Degree. | X | | | |
| Comments: | | | | |

**E.4 Significant work-based experience must be included representing additional instruction or training beyond the classroom such as:**

| Criteria | Documentation | | | Comments |
|---|---|---|---|---|
| | Full | Partial | None | |
| a. Cooperative Education; or | X | | | |
| b. Internships; or | X | | | |
| c. Job Shadowing; or | X | | | |
| d. Mentorships; or | X | | | |
| e. Project-based learning; or | X | | | |
| f. Service learning; or | | | | |
| g. A combination of the above. | | | | |
| Comments: | | | | |

**F. Length of program and daily schedule: Governor's STEM Academies are defined by program content, not by the location or delivery system of courses. Evidence of the following must be submitted:**

| Criteria | Documentation | | | Comments |
|---|---|---|---|---|
| | Full | Partial | None | |
| Designation of full-day or part-day, academic-year program. | X | | | |
| Comments: | | | | |

## G. Assurance from the fiscal agent that operating funds and facilities are available to support the Governor's STEM Academy and are adequate to meet the needs of the program

| | Documentation | | | Comments |
|---|---|---|---|---|
| | Full | Partial | None | |
| | X | | | |
| Comments: | | | | |

## H. Materials and equipment to be provided to accomplish program goals and objectives.

| | Documentation | | | Comments |
|---|---|---|---|---|
| | Full | Partial | None | |
| | X | | | |
| Comments: | | | | |

## I. Evidence of an internal evaluation process to effect program improvement, including:

| Criteria | Documentation | | | Comments |
|---|---|---|---|---|
| | Full | Partial | None | |
| 1. A review of the Academy's policies, procedures, and outcomes; | X | | | |
| 2. A review of the program design and instructional delivery; | X | | | |
| 3. Consideration of feedback from students, staff, parents, the community, and partnership members; and | X | | | |
| 4. Annual collection and reporting of data to the Department of Education related to student achievement, goal achievement, and other indicators. | X | | | |
| Comments: | | | | |

## IV. Administrative Procedures

Each Governor's STEM Academy must develop and maintain procedures developed cooperatively with participating partners. There should be evidence of procedures in the four areas that follow.

### A. Partnerships - The role of business and industry, public school divisions, and postsecondary institutions in the partnership. The role of workforce and economic development entities should also be included if they are among the partners.

| | Documentation | | | Comments |
|---|---|---|---|---|
| | Full | Partial | None | |
| | X | | | |
| Comments: | | | | |

### B. Student recruitment, selection criteria, and admissions.

| | Documentation | | | Comments |
|---|---|---|---|---|
| | Full | Partial | None | |
| | X | | | |
| Comments: | | | | |

### C. Code of student conduct and attendance.

| | Documentation | | | Comments |
|---|---|---|---|---|
| | Full | Partial | None | |
| | X | | | |
| Comments: | | | | |

**D. Transportation provided by the school division or consortium that is in compliance with all applicable federal and state regulations.**

| | Documentation | | | Comments |
|---|---|---|---|---|
| | Full | Partial | None | |
| | X | | | |
| Comments: | | | | |

**E. Staff recruitment, selection, and assignment - The Governor's STEM Academy shall hire staff members who meet the Virginia teacher licensure requirements and/or postsecondary faculty qualifications. Where applicable, they must have industry-specific education with training and experience, including industry certification.**

| | Documentation | | | Comments |
|---|---|---|---|---|
| | Full | Partial | None | |
| | X | | | |
| Comments: | | | | |

**F. Staff development - The program will provide appropriate staff training in addition to staff planning time.**

| | Documentation | | | Comments |
|---|---|---|---|---|
| | Full | Partial | None | |
| | X | | | |
| Comments: | | | | |

## G. Staff evaluation – Staff will be evaluated according to the human resources policies of the agency or institution employing Academy personnel.

| | Documentation | | | Comments |
|---|---|---|---|---|
| | Full | Partial | None | |
| | X | | | |
| Comments: | | | | |

## H. Parent, student and community involvement

| Criteria | Documentation | | | Comments |
|---|---|---|---|---|
| | Full | Partial | None | |
| 1. Preparation for entering the Academies should begin by eighth grade. | X | | | |
| 2. Students, parents, teachers, and counselors should work collaboratively to:<br>a. Complete career interest inventories; | X | | | |
| b. Prepare academic and career plans outlining an intended course of study in high school; | X | | | |
| c. Review multiple postsecondary pathways and the steps required to pursue them; | X | | | |
| d. Participate in career assessments to identify areas students should strengthen to qualify for their selected pathways; and | X | | | |
| e. Discuss available diplomas, seals, and other recognitions including admission to specialized programs such as Governor's Academies. | X | | | |

## Documentation of insurance, budget, and other fiscal information

| | Documentation | | | Comments |
|---|---|---|---|---|
| | **Full** | **Partial** | **None** | |
| Insurance | X | | | |
| Budget (from appendix) | X | | | |
| Budget Narrative | X | | | |
| Other | | | | |
| Comments: | | | | |

Attachment D

# New Commonwealth Governor's STEM Academy

## At Chantilly High School

*Advancing Excellence in Career & Technical Education for Virginia's Economic Future*

Fairfax County Public Schools
Fairfax, Virginia
April 2012

FAIRFAX COUNTY
PUBLIC SCHOOLS

Jack D. Dale, Superintendent
8115 Gatehouse Road
Falls Church, Virginia 22042

February 22, 2012

Virginia Department of Education
Office of Career and Technical Education Services
PO Box 2120
Richmond, VA 23218

Dear Sir or Madam:

President Obama, during the first-ever White House Science Fair that was held in 2010, said, "If you win the NCAA championship, you come to the White House. Well, if you're a young person and you produce the best experiment or design, the best hardware or software, you ought to be recognized for that achievement, too." As the Superintendent of Fairfax County Public Schools (FCPS), I want Virginia's students to not only participate at such an event but also to excel, thereby enhancing the reputation of Virginia's STEM programming.

Over the years, Chantilly Academy has demonstrated leadership in Career and Technical Education (CTE) in Northern Virginia through its innovative collaborations with community leaders, businesses, and educational organizations. I can think of no other organization in Northern Virginia that would be as qualified and dedicated to the success of such an endeavor. In turn, FCPS will provide the logistical support that is necessary to create an efficient yet effective STEM program at Chantilly Academy.

But this proposal is about more than winning science fairs. The New Commonwealth Governor's Academy will provide students with the knowledge and abilities needed to compete in the global arena of the 21st Century; it will also give them the confidence and encouragement they need for success later in life. The certification programs proposed by the Academy will provide businesses with industry validated assurance that graduating students are qualified and motivated for cutting-edge careers, including the two new program areas in engineering technology for advanced manufacturing and information technology-cybersecurity. For at-risk students, the Academy will be the reason they remain engaged in their educations. Programs that are relevant to today's marketplace will encourage them to pursue postsecondary studies. The expansion of the Academy's dual enrollment program with Northern Virginia Community College will provide an early college experience and college credits for <u>all</u> students and promote "college – going" confidence.

I hope that the Virginia Department of Education will recognize the merits of this proposal and approve the creation of a new, national showcase that will reflect Virginia's commitment to STEM education. Northern Virginia is an internationally recognized magnet to STEM companies and employees, and this initiative is desperately needed for our region's vital economic future.

Sincerely,

Jack D. Dale
Superintendent of Schools

**New Commonwealth Governor's STEM Academy**
**Board of Education Proposal**


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# INTRODUCTION

A collaboration that includes Chantilly High School and Chantilly Academy, Fairfax County Public Schools (FCPS), distinguished centers of postsecondary and higher education, and the Northern Virginia regional business community respectfully requests Governor's Science, Technology, Engineering and Mathematics (STEM) Academy status to advance STEM secondary education and bright futures in STEM at the proposed New Commonwealth Governor's STEM Academy (NCGSA). The goals of this proposed academy will be realized through current Career and Technical Education (CTE) program offerings and the addition of two new program areas: Engineering Technology/Advanced Manufacturing and Information Technology/IT Cybersecurity. The New Commonwealth Governor's STEM Academy and its partners will advance Fairfax County as a Work Ready Community through the adoption of Virginia's Workplace Readiness Skills and Virginia Career Readiness Certifications as a standard for all student graduates of the New Commonwealth Governor's STEM Academy.

## RATIONALE

### Current Programs at Chantilly Academy

**Mission**

FCPS administers six high school academies, CTE learning centers within existing high schools, which offer advanced technical and specialized courses that successfully integrate career and academic preparation. Chantilly Academy is the largest of six FCPS high school academies and is an embedded part-day magnet academy for student enrollment from twenty schools in the FCPS division.

As a dynamic learning environment, Chantilly Academy's mission is to offer high-value specialized career-oriented electives. Students gain professional experience, verified credit, professional licensure, and industry certifications, and earn college credits through dual enrollment agreements with James Madison University and Northern Virginia Community College (NOVA), as well as articulated credits with George Mason University–Volgenau School of Engineering and other postsecondary institutions.

**Student Demographics SY 2011–2012**

The students at Chantilly Academy represent a diverse community of learners, as shown in the following table:

| | |
|---|---|
| Total Number of Students | 1,210 |
| Totals by Grade Level | |
| • 10th Graders | 49 |
| • 11th Graders | 507 |
| • 12th Graders | 653 |
| • Postsecondary | 1 |
| Male Students | 656 54 percent |
| Female Students | 564 46 percent |
| Special Education Services | 23.8 percent |
| ESOL Services (Levels 1 – 5) | 11.9 percent |
| Free & Reduced Lunch Eligibility (Self-Reported) | 6.3 percent |
| Dropout Rate SY 2009-2010 | |
| Chantilly High School | 0.49 percent |
| FCPS Division (Grades 7-12) | 1.36 percent |
| Students by Ethnic Classification | |
| • White | 42.9 percent |
| • Black | 9 percent |
| • Hispanic | 23.3 percent |
| • American Indian | .08 percent |
| • Asian | 19.9 percent |
| • More than 2 races | 4.5 percent |
| • Hawaiian/Pacific Islander | .08 percent |

**High School/Center Representation**

Currently in academic year 2011-2012, 16 Division High Schools, 1 Alternative High School, 1 Public Day School, and 1 Contract Services School are represented at Chantilly Academy. Numbers of students from each school/center/ include the following:

**High Schools & Secondary Schools – 16 Schools**

Annandale (2)

Chantilly (530)

Herndon (71)

James Madison (5)

McLean (2)

James W. Robinson Secondary (51)

South Lakes (43)

Westfield High School (179)

Centreville (150)

Fairfax (79)

Langley (1)

George C. Marshall (6)

Oakton (26)

South County Secondary (1)

West Springfield (9)

WT Woodson (42)

**Alternative High School**

Mountain View Alternative Learning Center (7)

**Public Day School**

Cedar Lane Center (1)

**Contract Services School**

Kellar School (1)

## Career and Technical Education Course Offerings

Chantilly Academy's current educational mission addresses eight career cluster areas:

Architecture & Construction (2 courses);

Business Management and Administration (2 courses);

Health Science (10 courses);

Human Services (8 courses);

Information Technology (7 courses);

Law, Public Safety, Corrections and Security (2 courses);

Science, Technology, Engineering and Mathematics (7 courses); and

Transportation, Distribution and Logistics (4 courses).

A total of 42 specialized elective courses are offered. *For a complete list of all Academy courses, visit:* http://www.fcps.edu/ChantillyAcademy/Courses/Courses.html

## Establishing Academic and Business/Industry Partnerships

Over the past five years, Chantilly Academy has excelled in collaboration that has advanced CTE curriculum development, instituted dual enrollment, classroom and laboratory resources, service learning and career experience. Collaboration has resulted in innovative programs addressing work force development for Virginia's 21st century.

Chantilly Academy is in its fifth year of offering **"Girls Exploring Engineering - GE²"** – an all-girls section of Engineering Systems I (entry level course for engineering). This single-sex public education class was established to address the underrepresentation of young women in STEM courses. GE² offers one-on-one mentorship for each student with

a professional female engineer for year-long mentorship, guest lectures by distinguished women in engineering, and "behind the scenes" engineering field trips for current GE² students and GE² alumni who are currently enrolled in Academy upper level engineering classes. In 2010, Chantilly Academy advanced service learning through formal affiliation with Purdue University's Engineering Projects in Community Service (EPICS~High) program. Working with Quality of Life Plus (a community-based non-profit organization based in McLean, Virginia) and the Northern Virginia Association for the Blind, GE² student teams addressed the design challenge of "Radar for the Blind," using sensor technologies to assist individuals with vision impairment to navigate safely around low hanging tree branches, corded waiting lines found at airports, and banks and other obstacles not detected by traditional white cane navigation techniques.

GE² has been the grateful recipient of philanthropic investments in engineering education diversity by the ExxonMobil Foundation, Micron Technology, SRC Inc., Lockheed Martin, Wells Fargo Bank, and NOBLIS. To date, 83 percent of GE² alumni graduates are enrolled in distinguished centers of engineering higher education, including the following:

Virginia Polytechnic Institute and State University,

University of Virginia,

Virginia Commonwealth University,

Massachusetts Institute of Technology,

Purdue University,

James Madison University,

University of South Carolina,

Clemson University,

Georgia Institute of Technology,

Harvey Mudd College,

California Polytechnic Institute,

Carnegie Mellon University,

University of Rhode Island,

Brown University,

Auburn University,

The Citadel,

Rochester Institute of Technology,

Embry Riddle Aeronautical University – Prescott,

Stevens Institute of Technology,

George Washington University,

Northern Virginia Community College, and

Northwestern University.

Four years ago, Chantilly Academy joined with Wright State University in Dayton, Ohio, and 14 other universities/colleges on a National Science Foundation (NSF) Phase 3 CCLI grant for **"Mathematical Applications in Engineering."** This NSF CCLI Phase III grant provided Chantilly Academy with $100,000 to modify a 10-week university freshman engineering mathematics class to a 36-week upper level mathematics high school course for students planning to pursue engineering higher education. The NSF grant funded curriculum development, teacher salary, textbooks and lab equipment. "Engineering Math" is an engineering problems-based approach to learning the

mathematics that will be required in pursuit of an undergraduate engineering degree. In its third year, the course is delivered by a teacher with an undergraduate degree in electrical engineering, and endorsements in physics and mathematics to one section of 31 promising future engineers.

In its fourth year, **Independent Research – Engineering** was developed as a senior capstone course and offers a work-based learning experience through mentorship in corporate, government, and higher education organizations. Independent Research – Engineering students have benefited from yearlong mentorship placements at Northrop Grumman Information Systems, U.S. Naval Research Laboratory (NRL) – Center for Naval Space Technologies, Micron Technology, ESI Total Fuel Management, George Mason University – Krasnow Institute Neural Lab, and Patton Harris Rust & Associates, PC. In SY 2011–2012, , five students are teamed on a Center for Naval Space Technologies design challenge at the NRL, and one student is completing mentorship at ESI Total Fuel Management in an engineering design and engineering management project.

In response to our Commonwealth's and our nation's work force need to educate and train **Geographic Information Systems (GIS)** analysts and technicians, three years ago Chantilly Academy partnered with NOVA and two other Virginia high schools on a U.S. Department of Labor - Technology Based Learning Grant to establish GIS secondary education that is dual enrolled with NOVA. This successful grant resulted in a dual enrollment for a class of GIS students, new industry relevant computer hardware and software, GIS conference participation for our students, and industry/government

internships. Chantilly Academy's GIS students took first place in the state in a Technology Students of America (TSA) design challenge.

In its second year, GIS is dual enrolled with James Madison University (JMU) for three college credits for our students, and an expert GIS professional from the SI Organization in Chantilly, Virginia, and JMU faculty are providing both classroom enrichment and professional staff development support for Academy faculty.

In 2011, Chantilly Academy entered a school/business partnership with ProFinishes Plus that is advancing 21st century *green technology* in the Academy's **Automotive Collision Services** program. This new partnership has resulted in a state-of-the-art Automotive Collision Services program with waterborne automotive paint technology that prepares students for competitive, high-value, high-salary employment in the auto collision services industry. It is expected that in the coming years, the automotive collision services industry will be mandated by both federal and state governments to transform its current use of solvent-based paints to waterborne paints to remediate environmental impact.

Through this partnership, ProFinishes Plus is enabling Chantilly Academy's Automotive Collision Services program to update its shop with new equipment (sprayers, mixers, fans), in order to educate and train students in this latest technology. The Academy's two-year program now prepares students for future careers as *state-of-the-art* collision services technicians. Moreover, the transformation to waterborne paint technology has resulted in a cleaner classroom and shop environment for students, faculty, and the

general school community. The ProFinishes Plus Partnership is working to establish an Advisory Committee to guide the development of the program according to local industry expectations for competencies; co-promote student achievement, postsecondary educational opportunities, and gainful employment; and solicit support for student tool grant scholarships for program graduates entering the work force.

Chantilly Academy's Engineering program has agreed to support the efforts of the University of Virginia – School of Engineering & Applied Science and University of Maryland - A. James Clark School of Engineering in the research and piloting of an ***Advanced Placement® and/or dual enrollment process for Engineering Design***. The Academy's Engineering Instructor and Career Experience Specialist were invited to attend a two-day workshop at UVA, December 1-2, 2011, to review and comment on the Engineering Design Process Portfolio Scoring Rubric and an e-portfolio to be incorporated into the AP Engineering Design program. Chantilly Academy began piloting the scoring rubric beginning in January 2012. This research is being sponsored by the National Science Foundation and the Kern Family Foundation.

Chantilly Academy is an established and respected partner with industry, government, and postsecondary and higher education, as well as an incubator of new programs and secondary CTE curriculum for replication across our state and nation. The resulting opportunities have enriched student experiences in design, innovation, and access to contemporary technologies. We are committed to building on this history of achievement to advance the three new high-value, high-impact initiatives presented in this proposal.

**Establishment of the New Commonwealth Governor's STEM Academy**

Innovation is critical to Virginia's competitiveness in this global market. The New Commonwealth Governor's STEM Academy will be the premiere delivery site in FCPS for STEM CTE education in the following principal areas: Engineering and Technology, Information Technology, Workplace Readiness Skills (WRS) and Career Readiness Certificate (CRC).

Three new program areas have been selected that are strategically aligned with today's work force demands and will enable students to acquire knowledge and skills that will prepare them for success in postsecondary/higher education pathways and entrance to sustainable, high-wage, high-skill careers in our Northern Virginia region and across the Commonwealth.

The new Academic programs are dynamic and strategic expansions of current offerings in Technology, Engineering and Mathematics—Engineering Technology with an emphasis on Advanced Manufacturing; and Information Technology—with an emphasis on Cybersecurity. Adoption of the Virginia Workplace Readiness Skills (WRS) and Virginia Career Readiness Certification (CRC) programs will advance the Academy's commitment to postsecondary education and workplace readiness for its graduates.

**Program Description**

**Program Objectives and Performance Measures**

We will optimize our strong and productive relationships with postsecondary and higher education, and our regional business community over the next three to five years to accomplish the objectives outlined below:

- Working with the FCPS CTE Coordinator, CTE Program Managers and the NCGSA Advisory Committee, the Academy will annually validate current course offerings to prepare students with relevant, high demand, high value industry certifications that enable them to be "work-ready" upon graduation, and/or be prepared for postsecondary and higher education after high school graduation.
- Deliver two new well-articulated career pathways in Engineering Technology and Information Technology/Security that are intertwined with high school credits, community college, and university credits. (See Career Pathways - Attachments)
- Graduates will have earned a minimum of 12 college credits in two new program areas; working with NOVA's Director, Dual Enrollment and Tech Prep and Academy faculty, additional dual enrollment opportunities will be explored in all Academy program areas.
- Advance Fairfax County as a major proponent of a statewide initiative to foster Certified Work Ready Communities through the adoption of the WRS and CRC certifications. In collaboration with NOVA, the New Commonwealth Governor's STEM Academy will become an authorized CRC proctoring and test site to

administer CRC assessments to more than 500 senior CTE students annually by AY 2014–2015.

- Year over year increases in WRS certifications will increase by 10 percent beginning in year three of the new Academy.
- In Year Two, (1). increase the numbers of all Academy programs' seniors participating in CRC certification; and (2.) achieve a pass rate of 45 percent earning Bronze, Silver, Gold or Platinum CRC Certification in Year three.
- Increase the number of CTE Diploma Seals earned by Academy graduating seniors by 10 percent annually beginning in year one.
- Working with Departments of Student Services at Chantilly High School and 19 additional "feeder" high schools, optimize student outreach and recruitment targeting academically "at-risk" students to increase high school graduation rates. The Academy administration will develop baseline drop-out statistics for all feeder schools, identify "at-risk" students during the recruitment process, and track retention and high school completion rates by AY 2013–2014.
- NCGSA will institute a new graduation tracking system by AY 2014–2015 for all Academy graduating seniors capturing postsecondary plans. Data will be collected through annual senior surveys and contact with Departments of Student Services in all feeder high schools by the Academy Counselor and Career Experience Specialist.
- Increase the number of NCGSA students sitting for industry certifications by 15 percent by year two.

- Increase the number of NCGSA students earning industry certifications year after year by 10 percent in the first three years of the New Commonwealth Governor's STEM Academy.

**Exemplary Standards Award for Career and Technical Education**

In 2005, Chantilly Academy teachers, in accordance with guidelines outlined for the Governor's Exemplary Standards Award for Career and Technical Education, developed and implemented an evaluation process based on the US Department of Education, Office of Educational Research and Improvement (OERI) Exemplary Career-Technical Education (CTE) Program Evaluation Criteria. Data from the FCPS CTE State Report Card, school attendance and disciplinary records, learner performance on standardized tests (i.e., VA SOL, SAT, ACT, industry certification, credentials, licensure tests), and feedback from postsecondary programs and employers was compiled, maintained, and evaluated by Academy staff. Based on an analysis of data, program managers will continue to design and implement program adjustments.

The new Academy's administrative staff intends to fully participate in the Governor's Exemplary Standards Award Program for Career and Technical Education.

An Academy panel comprised of postsecondary and higher education faculty, and business partners and the FCPS CTE Advisory Committee will periodically review the data to ensure continuing improvement in program quality, educational significance,

and effectiveness and student success. Improvement plans for each participating CTE program will be developed and periodically reviewed and assessed by FCPS Office of CTE with the support of CTE program managers, school site-based administrators, and the CTE Coordinator.

## Engineering Technology – Advanced Manufacturing in Virginia

### Need

Based on the 2007-2012 Skilled Trades Gap Analysis Report: Final Report (Commissioned by the Virginia Manufacturers Association, Virginia Workforce Council and Virginia Manufacturing Advisory Council) advanced manufacturers want a more rigorous course of study in CTE programs. The Final Report indicates that "83 percent of the manufacturers who responded to the survey agreed that there should be additional requirements for Career and Technical Education in Virginia's K-12 education system."

This study found that entry-level workers in manufacturing often lack critical skills, including soft skills, measurable skills, and knowledge of basic manufacturing principles. To reduce the problems associated with identifying and addressing these deficits, manufacturers strongly support additional requirements for career and technical education in Virginia's K-12 education system, and the creation of a statewide credentialing program for manufacturing. Another finding was that the public image of manufacturing occupations significantly contributes to the problems employers experience in recruiting skilled workers.

Not only do high tech corporations need skilled workers who can fill entry level positions, they also need workers who possess the knowledge to be innovative. Virginia needs high school graduates prepared to enter a business or industry with the skills to be successful from day one; including critical thinking skills that foster collaborative teams and promote an environment that incubates innovation for the next generation of technology.

The survey makes a strong case for the need for Virginia to grow its own work force so that new patents in advanced manufacturing technology are developed in Virginia, and skilled workers value the Commonwealth as the best place to live and work.

**Engineering Technology** curriculum responds to *The National Governors Association (NGA) Center for Best Practices Science, Technology, Engineering and Math Center Grant Program Gap Analysis on Virginia's Policy Landscape* ***Section on Misalignment: Skilled Workforce (2007).*** According to the NGA, "Virginia does a relatively good job of producing and attracting workers at the most highly educated levels in STEM fields, including scientists and engineers. We are less successful in developing workers with specialized postsecondary and occupational training such as technicians, technologists, and skilled labor. At a recent Governor's Manufacturing Summit, researchers projected that approximately 40 percent of the skilled labor workforce is expected to retire in the next five years, and the pipeline to replace these workers is inadequate."

In 2007, the Virginia Biotechnology Association noted that, "Virginia anticipates more than 100,000 retirements among advanced manufacturing workers (including 45,000 technically skilled workers) over the coming decade and a major surge of demand for skilled labor as our state's bioscience, pharmaceutical, and semiconductor companies continue to expand their operations."

**Pathway**

The New Commonwealth Governor's STEM Academy will build on Chantilly High School's recognized expertise in engineering education to create an **Engineering and Technology** pathway, which will have a primary focus on Engineering Technology. This new pathway expands STEM education and STEM careers for FCPS students that are drawn to analytical thinking, creative problem solving, engineering design, and advanced technologies.

Our "dream it–do it" scenario is to create a model for a high school-based Engineering Technology program (dual enrolled for an AAS in Engineering Technology–with transferable credits) that incorporates a new school-based Virginia Career Readiness Certification (CRC) capacity and the authorization to provide an industry certification. Two certifications are under review at this time for adoption: the Manufacturing Skill Standards Council (MSSC) Certified Production Technician and is currently approved by the Virginia Department of Education

The Manufacturing Technician position is an excellent example of the evolution of the advanced technology skills students will need to enter, operate and succeed in

corporations (including Micron Technology, Lockheed Martin, and Orbital Sciences Corporation in the FCPS area) engaged in high-end engineering processes.
The Academy's dual enrollment program relationship with NOVA will be expanded to include College Composition, Precalculus, Engineering Graphics, Basic Programming Applied to Electrical/Electronic Calculations, and DC Fundamentals. The New Commonwealth Governor's STEM Academy will form a new alliance in dual enrollment with Chantilly High School English and Mathematics Departments that will enable Chantilly High School and students from other division high schools to dual enroll in core classes in each of these new programs at the Academy. The opportunity to earn 17 college credits will foster the college readiness of Engineering Technology students and boost student confidence for future college success.

This new program includes long-time stakeholders and partners Micron Technology, NOVA, Old Dominion University, and the Virginia Council for Advanced Technology Skills /Virginia Manufacturers Association. New program partners include Lockheed Martin, Orbital Sciences Corporation, and Norfolk State University.

Old Dominion University (ODU) and Norfolk State University (NSU) offer Bachelor of Science degrees in Engineering Technology. Students who have earned an AAS degree in Engineering Technology from any community college in Virginia may transfer to ODU and NSU to earn BS degrees. ODU and NSU faculty will collaborate with the New Commonwealth Governor's STEM Academy to encourage student achievement through curriculum development, ongoing curriculum validation, distance education/guest faculty lectures via existing video conferencing capabilities between

the Academy and their university campuses, and an annual student and parent community education program that promotes pathways in Engineering Technology to advanced manufacturing careers. ODU and the Academy are committed to establishing an additional pathway for Engineering Technology students through dual enrollment with Old Dominion University, enabling students to complete a four-year degree at Old Dominion University and/or a "two plus two" transfer from NOVA. Mentors who are experts in advanced manufacturing systems will be recruited from regional workplaces to work closely with Academy students to prepare them for the industry certification assessments and entry into the advanced manufacturing work force.

This pathway provides "real-world" career opportunities for all Academy graduates; high school to work, high school to postsecondary training, and high school to higher education. Employers will gain highly skilled entry-level workers, and may provide tuition assistance for college degree progress.

## Engineering Technology - Program & Course Descriptions

**ENG 111 - 112 COLLEGE COMPOSITION I-II – (3 Cr.) (3 Cr.)**
Prerequisites are a satisfactory score on appropriate English proficiency examinations and four units of high school English or equivalent. Develops writing ability for study, work, and other areas of writing based on experience, observation, research, and reading of selected literature. Guides students in learning writing as a process, understanding the audience and purpose, exploring ideas and information, composing, revising, and editing. Supports writing by integrating experiences in thinking, reading, listening, and speaking.

**MTH 163 Precalculus I – (3 Cr.)**
Prerequisites are a satisfactory score on an appropriate proficiency examination and Algebra II and Geometry, or the equivalent of these two courses. Presents college algebra, matrices, and algebraic, exponential, and logarithmic functions.

**EGR 115 Engineering Graphics – (2 Cr.)**
Applies principles of orthographic projection and multi-view drawings. Teaches descriptive geometry including relationships of points, lines, planes, and solids. Introduces sectioning, dimensioning, and computer graphic techniques.

**ETR 113 DC Fundamentals I – (4 Cr.)**
This course introduces DC Circuits, Basic Electrical Components, Instruments, network theorems, and techniques used to predict, analyze, and measure electrical quantities.

**ETR 106 Basic Programming Applied to Electrical/Electronic Calculations – (2 Cr.)**
Teaches the application of a high-level language to electrical and electronic problem solving and circuit analysis. Introduces an operating system.

## Requirements for Successful Program Completion

Dual enrolled college courses (totaling 17 college credits) will provide students with the opportunity to accelerate their studies towards the completion of an Associate of Applied Science (AAS) degree or Associate of Science (AS) degree in General Studies at NOVA. Students continuing their education may transfer credits to Old Dominion University or Norfolk State University in pursuit of a Bachelor of Science degree in Engineering Technology. These courses will include:

**YEAR 1**

- MTH 163 Precalculus 1(3 credits) — **Pre-Calc w/ Trig** (FCPS #316000 )
- EGR 115 Engineering Graphics (2 credits) — **Engineering Drawing** (FCPS #843600)

**YEAR 2**

- ENG 111 College Composition I (3 credits) — **English 12** (FCPS #116000)

| | |
|---|---|
| o ENG 112 College Composition II (3 credits) | **English 12** (FCPS #116000) |
| o ETR 113 DC Fundamentals I (4 credits) | **Electronics 1** (FCPS # 841600) |
| o ETR 106 Basic Programming Applied to Electrical/Electronic Calculations (2 credits) | **Electronics 2** (FCPS #841200) |

**Industry Certification**

Two industry certifications are under review for adoption:

The **Manufacturing Skill Standards Council (MSSC)** is an industry-led training, assessment and certification organization focused on the ***core technical competencies*** needed by the nation's front-line production and material handling workers. The nationwide MSSC certifications, based upon industry-defined and federally-endorsed national standards, offer both entry-level and incumbent workers the opportunity to demonstrate that they have acquired the knowledge and skills increasingly needed in the technology-intensive jobs of the 21st century. MSSC has developed a nationally portable certification for this work force that is currently approved by VDoE:

***Certified Production Technician (CPTAE)***: The CPTAE Certification addresses the core technical competencies of higher skilled production workers in all sectors of manufacturing. MSSC awards certificates to individuals who pass any of its five Production Modules: Safety; Quality Practices & Measurement; Manufacturing Processes & Production; Maintenance Awareness; Green Production and a full CPTAE Certification to those who pass all four original modules  Accredited by ANSI under ISO

17024 (Personnel Certification), MSSC initiated a new CPT with an "AE" designation which stands for "ANSI Edition".

**The Virginia Council on Advanced Technology Skills (VCATS)**, VMA's Workforce Development Division, is working to meet Virginia's present and future needs for skilled technical workers by setting the standard for success in industry. As Virginia's only competency-based industry-endorsed work force training and certification organization, VCATS provides a customized fast track pathway to credentials for a 21st-Century advanced technology career. The VCATS training and certification system, designed and validated by industry partners, is intended to develop a work force pipeline capable of meeting the cutting-edge requirements of existing and emerging employers in advanced technology fields, such as pharmaceutical, biotechnology and biomedical, chemical, advanced materials, plastics, and semiconductor manufacturing.

The Manufacturing Technician Assessment measures individual skills attainment in 12 critical technical skills. The complete assessment includes three sections:

Math and Measurement;

Spatial Reasoning and Manufacturing Technology; and,

Quality and Business Acumen.

A partial assessment can also be given. The assessment is online; each section takes approximately an hour; and, an individual has up to three hours to complete the full assessment.

The **Manufacturing Specialist Certificate** is awarded to individuals upon a successful pass rate of 75 percent on the following two Manufacturing Technician Assessment sections: Math and Measurement, and Spatial Reasoning and Manufacturing Technology. The **Manufacturing Technician Certificate** is awarded to individuals upon a successful pass rate of 75 percent on all three of the Manufacturing Technician Assessment sections: Math and Measurement; Spatial Reasoning and Manufacturing Technology; and, Quality and Business Acumen.

Students earning the CRC (see pp. 34–44) and the Level I Manufacturing Technician certifications, College English and Mathematics dual enrollment credits with NVCC will be competitive for employment in high-paying, entry-level positions in advanced manufacturing with Micron Technology, Lockheed Martin, Orbital Sciences Corporation, and other advanced manufacturing organizations. This certification will be submitted to VDOE for approval by the VMA in the 2012-2013 academic year.

**Enhancements**

In 2007, Micron Technology and Chantilly Academy signed a formal partnership agreement to advance secondary engineering, computer science, and information technology education. Each year, Chantilly Academy students benefit from engineering research internships; tours of Micron's semi-conductor manufacturing operations in Manassas, Virginia; mentorship with professional engineers, and philanthropic investments in Chantilly Academy's annual Engineering EXPO & Engineering College Fair; sponsorship of FIRST Robotics Chantilly 612 Team; and funding for the acquisition of advanced classroom/lab equipment.

The New Commonwealth Governor's STEM Academy will expand its current ***Independent Research*** senior capstone course to offer ***Independent Research - Engineering Technology*** to enable students to benefit from work based learning experiences in an advanced manufacturing environment.

Chantilly Academy's proposal to expand its STEM offerings through the addition of an **Engineering Technology/Advanced Manufacturing** program is an innovative outgrowth of existing partnerships with industry, postsecondary and higher education; our corporate partners' growing investments in the Commonwealth of Virginia; and our shared commitment to sustainable high-value, high-impact careers for Virginia's young people.

Working with our manufacturing partners, we will promote the National Association of Manufacturer's "Dream It – Do IT" and the VMA's "Manufacturing Makes Virginia" education campaigns, showcase careers in advanced manufacturing and highlight academic preparation. In preparation for full program launch in the 2013-2014 academic year, the Academy will present Open House programs for prospective students and parents, guest speakers on Engineering Technology and Advanced Manufacturing (postsecondary/higher education and employers), field trips to advanced manufacturing sites, summer internships, and workplace readiness. This initiative will also recruit manufacturing professionals to serve as mentors for those students preparing to complete a Certified Production Technician or a Manufacturing

Technician Certification assessment. Mentorship will be scheduled for after-school and/or Saturday morning sessions at the Academy.

**Co-curricular student organizations** will include First Robotics Chantilly 612 Team, Technology Students of America (TSA), Rocketry/Aerospace Club (Federation of Galaxy Explorers), and IEEE Student Club.

## Information Technology - Cybersecurity

### Need

In the 2005 Report to the President, *Cyber Security: A Crisis of Prioritization*, the President's Information Technology Advisory Committee stated,

> "The IT infrastructure in the United States is highly vulnerable to premeditated attacks with potentially catastrophic effects. Thus, it is a prime target for cyber terrorism as well as criminal acts.
>
> The IT infrastructure encompasses not only the best-known uses of the public Internet—e-commerce, communication, and Web services—but also the less visible systems and connections of the Nation's critical infrastructures such as power grids, air traffic control systems, financial systems, and military and intelligence systems. The growing dependence of these critical infrastructures on the IT infrastructure means that the former cannot be secure if the latter is not.
>
> Although current technical approaches address some of our immediate needs, they do not provide adequate computer and network security. Fundamentally different architectures and technologies are needed so that the IT infrastructure as a whole can become secure."

According to the Greater Washington Initiative's 2011–2012 Regional Report, cyberspace has emerged as the fifth domain of warfare—in addition to land, sea, air, and space. Global firms and start-ups in Greater Washington are developing next generation technologies to secure the world's government and corporate digital infrastructures.

The United States faces a chronic shortage in the quality and quantity of its cybersecurity experts, leaving the nation unprepared to defend itself against increasingly sophisticated online attacks. "A critical element of a robust cybersecurity strategy is having the right people at every level to identify, build, and staff the defenses and responses. And that is, by many accounts, the area where we are the weakest." So says "A Human Capital Crisis in Cybersecurity," a new study into computer security manpower challenges and potential solutions released by the Center for Strategic and International Studies (CSIS) Commission on Cybersecurity for the 44th President.

According to the commission's report, "we not only have a shortage of the highly technically skilled people required to operate and support systems already deployed, but also an even more desperate shortage of people who can design secure systems, write safe computer code, and create the ever more sophisticated tools needed to prevent, detect, mitigate, and reconstitute from damage due to system failures and malicious acts."

This warning was echoed by Jim Gosler, a fellow at Sandia National Laboratory, National Security Agency visiting scientist, and the founding director of the CIA's clandestine information technology office. Gosler said that "we don't have sufficiently bright people moving into this field to support those national security objectives as we move forward in time." Gosler has previously estimated that the United States requires 10,000 to 30,000 people who are highly skilled at cybersecurity but that currently, only about 1,000 are available.

According to the Heinz College at Carnegie Mellon University, a recognized university leader in cybersecurity education, *the average* entry-level salary for cybersecurity graduates has increased steadily, from $69,788 in 2007 to $80,275 in 2010. The industry expects cybersecurity salaries to continue to increase, and predicts strong sustainability in this career sector.

High school students who are interested in computer sciences and information technology and protecting IT systems will find a lucrative and sustainable market for their skills for the foreseeable future. Knowledge is king in the information technology world, and there is no better demonstration of that attribute on an employment application or résumé than industry recognized professional certifications. Government, military, and industry are engaged in programs and academic competitions that grab the attention of students and identify talent in high school. Industry partners to the nationwide Air Force Association's CyberPatriot Competition include Northrop Grumman, SAIC, Raytheon, Boeing, General Dynamics, Microsoft, and AT&T. Each of these organizations have major presence in our Northern Virginia and

Greater Washington, D.C., region. Their very "real-world" motives for participation reflect the critical need for cybersecurity talent and work force development.

## Pathway

The New Commonwealth Governor's STEM Academy is positioned to respond to the cybersecurity grand challenge through enhancements to its **Network Systems** pathway. Chantilly Academy will collaborate with NOVA; Northrop Grumman Information Systems; SRC Inc.; The SI Organization and Office of the Under Secretary of Defense for Acquisition, Technology and Logistics, US Department of Defense; and others to enrich its current program in secondary Information Technology education.

As we transition from Chantilly Academy to the New Commonwealth Governor's STEM Academy, we will expand specialized dual enrolled college course offerings with NOVA to include courses in cybersecurity. These high-level options will accelerate student studies leading to a Career Studies Certificate in Cybersecurity, or an Associate of Science Degree in Information Technology with an emphasis in Cybersecurity at NOVA, and/or a Bachelor of Science in Information Technology – Information Security at George Mason University.

Three new dual enrolled courses include ITE 115–Introduction to Computer Applications and Concepts, ITN 120–Wireless Network Administration, and ITN 260–Network Security Basics.

**Program and Course Descriptions**

For more than twelve years, Chantilly Academy has delivered invaluable instruction in Information Technology, through courses including: Computer Systems Technology–A+, Network Administration (2-year program), Cisco Academy (two-year program–Cisco Academy Levels 1-4) and Oracle. Academy students have benefited from opportunities to earn industry certifications, dual enrollment college credits with NOVA, as well as internships with Fairfax County Public Schools' Department of Information Technology, Rolls-Royce of North America, GTSI, and Northrop Grumman Information Systems.

According to *Government Computer News* (April 2011), "Qualification documentation is moving away from traditional areas such as network administration to accommodate new skills such as cybersecurity. In fact, cybersecurity and other qualified IT security skills are in high demand in the federal government. A recent study by Clearancejobs.com and Dice.com found that professionals with the right IT skills and an active government security clearance earned 12 percent more than non-cleared personnel. In the Washington, D.C., area, the pay bump is 20 percent."

The following courses and descriptions will compose the Information Technology–Cybersecurity program at the New Commonwealth Governor's STEM Academy:

**ENG 111-112 - COLLEGE COMPOSITION I-II – (3 Cr.) (3 Cr.)**
Prerequisites are a satisfactory score on appropriate English proficiency examinations and four units of high school English or equivalent. Develops writing ability for study, work, and other areas of writing based on experience, observation, research, and reading of selected literature. Guides students in learning writing as a process, understanding the audience and purpose, exploring ideas and information,

composing, revising, and editing. Supports writing by integrating experiences in thinking, reading, listening, and speaking.

**MTH 163 Precalculus I – (3 Cr.)**
Prerequisites are a satisfactory score on an appropriate proficiency examination and Algebra II and Geometry, or the equivalent of these two courses. Presents college algebra, matrices, and algebraic, exponential, and logarithmic functions.

**ITN 154 – Cisco 1 – (4 Cr.)**
Provides introduction to networking using the OSI reference model. Course content includes data encapsulation, TCP/IP suite, routing, IP addressing, and structured cabling design and implementation.

**ITN 155 – Cisco 2 – (4 Cr.)**
Features an introduction to basic router configuration using Cisco IOS software. Course content includes system components, interface configuration, IP network design, troubleshooting techniques, configuration and verification of IP addresses, and router protocols.

**ITN 156 – Cisco 2 – (4 Cr.)**
Centers instruction in LAN segmentation using bridges, routers, and switches. Course content includes fast Ethernet, access lists, routing protocols, spanning tree protocol, virtual LANs, and network management.

**ITN 157 – Cisco 2 – (4 Cr.)**
Concentrates on an introduction to Wide Area Networking (WANs). Course content includes WAN design, LAPB, Frame Relay, ISDN, HDLC, and PPP.

**ITE 115 – Introduction to Computer Applications & Concepts – (3 Cr.)**
Covers computer concepts and Internet skills and uses a software suite, that includes word processing, spreadsheet, database, and presentation software to demonstrate skills.

**ITN 100 Introduction to Telecommunications – (3 Cr.)**
Covers computer concepts and Internet skills and uses a software suite, that includes word processing, spreadsheet, database, and presentation software to demonstrate skills.

**ITN 120 Wireless Network Administration – (3 Cr.)**
Provides instruction in fundamentals of radio frequency and spread spectrum technology and wireless networking systems implementation and design. Course content includes radio frequency and spread spectrum concepts, 802.11 standards and regulations, wireless network architecture, topology, software, equipment, OSI Model, site surveys, security features, and the design and implementation of wireless network solutions.

**ITN 260 Network Security Basics – (3 Cr.)**
Explores the basics of network security in-depth. Includes security objectives, security architecture, security models and security layers. Discusses risk management, network security policy, and security training. Discusses the five security keys: confidentiality, integrity, availability, accountability, and auditability.

## Requirements for Successful Program Completion

Working with NOVA, the following courses (37 college credit hours) will be offered for dual enrollment:

**YEAR 1**

- MTH 163 Precalculus 1 (3 credits) — **Pre-Calc w/ Trig** (FCPS #316000)
- ITN 154 Cisco 1 (4 credits) — **Cisco I – Part A** (FCPS #854232)
- ITN 155 Cisco 2 (4 credits) — **Cisco I – Part B** (FCPS #854332)
- ITE 115 Introduction to Computer Applications & Concepts (3 Cr.) — **Information Systems** (FCPS #661200)
- ITN 100 – Introduction to Telecommunications (3 Cr.) — **Network Administration I** (FCPS #665032)

**YEAR 2**

- ENG 111 College Composition I (3 credits) — **English 12** (FCPS #116000)
- ENG 112 College Composition II (3 credits) — **English 12** (FCPS #116000)
- ITN 156 Cisco 3 (4 credits) — **Cisco II – Part A** (FCPS # 854432)
- ITN 157 Cisco 4 (4 credits) — **Cisco II – Part B** (FCPS # 854532)
- ITN 120 – Wireless Network Administration (3 Cr.) — **Network Administration II** (FCPS #665132)

- ITN 260 – Network Security Basics (3 Cr.) **Network Administration II** (FCPS#665132)

**Industry Certification**

Students pursuing Information Technology studies at the New Commonwealth Governor's STEM Academy will be eligible to earn the following industry recognized certifications: Virginia Career Readiness Certification (CRC), IC3, A+ CompTIA, CCNA, ICDN (2 parts), NetPlus, MTA, Microsoft Office Specialist (MOS), Microsoft Certified Professional (MCP), and Certified Internet Webmaster (CIW), and begin preparation for CISSP. IT Cybersecurity students may benefit from enrollment in an IT Co-op Course earning an additional CTE credit toward the CTE Diploma Seal or the CTE Advanced Technical Diploma.

**Enhancements**

In collaboration with Fairfax County Public Schools, the Northern Virginia Technology Council (NVTC) hosts an annual Job Shadow Day Program among its member organizations in the Northern Virginia community for Academy students to gain insights into "real-world" IT operations and careers. Students are matched with hosting NVTC member organizations for job shadows that are "door openers" for summer internships and/or part-time employment opportunities.

For the past two years, Chantilly Academy Information Technology and Air Force Junior ROTC students have heard an impassioned plea for cybersecurity education and careers from personnel at the Office of the Undersecretary of Defense (OUSD)

Acquisition, Technology and Logistics at Federal IT Job Shadow Day Programs at the U.S. Pentagon. Personnel from this DoD office also participated in the 2011 Engineering EXPO & Engineering College Fair to encourage cybersecurity education and careers in both the private and public sectors. The OUSD will serve as a Representative to the Advisory Committee and provide resources to the NCGSA on work force development in cybersecurity.

For the second consecutive year, in 2012 Chantilly Academy students who are enrolled in Engineering, Air Force Junior ROTC and IT programs were recruited and formed student teams in Air Force Association's (AFA) Annual CyberPatriot competition. This year, fifty-seven students served on five teams in competition. Northrop Grumman Information Systems and SRC Inc. provided cybersecurity experts as mentors to support student education in information assurance and team competition. Two of the Academy's five teams qualified and participated in the CyberPatriot IV National Semi-Finals Competition representing the Commonwealth of Virginia in the national semi-finals.

Northrop Grumman and Chantilly High School/Chantilly Academy are celebrating the twenty-fifth year of an invaluable school/business partnership this academic year. Northrop Grumman Information Systems' Cyber Academy, located in McLean, Virginia, is currently pursuing an increased investment in K–12 and higher education that will advance the cybersecurity work force pipeline.

Northrop Grumman played a leadership role in the recent **2011 Engineering EXPO & Engineering College Fair** presented by Chantilly Academy for students in grades 7-12 in the FCPS division. The keynote presentation was on "Cybersecurity: An Engineering Grand Challenge" by Dr. Paul Seay of Northrop Grumman Information Systems.
At this event, Northrop Grumman CyberAcademy professionals outlined the challenge in today's society, as well as ways to assure personal/school cybersecurity, and presented CyberAcademy workshops (unclassified), and career exploration sessions for the more than 500 students and their parents in attendance on October 22, 2011.

Northrop Grumman and the New Commonwealth Governor's STEM Academy are now working to develop an annual summer program, **"Cybersecurity Camp"** for FCPS division students in rising 9–12 grades to be offered for the first time in summer 2012 at the Academy and Chantilly High School. This week-long program will highlight key issues in information assurance, Internet personal safety, careers in information security and Academy programs in Information Technology and CyberSecurity.

The Academy is securing a new partnership with **The SI Organization**. The SI Organization is a leading provider of full life cycle, mission-critical systems engineering and integration services to the U.S. Intelligence Community, Department of Defense, and other agencies. They have a 40-year history of successfully delivering complex system-of-systems technology solutions. In addition to providing mentors for the Academy's $GE^2$ program, the partnership will be expanded to include their new Spires Program.

The Spires Program goal is to select current high performing engineering and business professionals with the desire to become leaders and train them for leadership positions within their company. One of the key components of the program is community service. The SI is committed to giving back to the community through collective brainpower, man hours, or resources. Spires's participants with expertise in engineering, geographic information systems and cybersecurity/information assistance will serve on the Planning and Advisory Committees in support of mentorship, classroom enrichment, work-based learning experiences, curriculum development, and program validation in Information Security.

The Academy is also securing a new school/business partnership with **SRC Inc.** that will include: job shadows, internships, guest lecturers and an annual college scholarship for a graduating minority student planning to pursue postsecondary education in Information Technology–CyberSecurity.

Co-curricular student organizations associated with this program of studies include Air Force Association's (AFA) CyberPatriot Competition, IEEE Student Club at Chantilly Academy (founded in 2009), SkillsUSA, and Future Business Leaders of America (FBLA).

## Preparing Our Graduates for Work and Postsecondary Education Success

Virginia Workplace Readiness Skills (WRS) - Virginia Career Readiness Certification (CRC)

## Need

The Commonwealth of Virginia recognizes that in order for our state to maintain its global competitiveness, Virginia must deliver the highest quality of goods and services at the most economical price point. In order for businesses to achieve this objective, they must hire the most capable and productive employees to join their work forces. Today, there is a considerable regional, statewide and national debate on the importance of workplace "soft" and technical skills and the development of key criteria for who will be hired, promoted or even, separated from employment.

According to "Workplace Readiness and Industry Credentials: What Do State High School Policy Makers Need to Know", a report by Robert D. Muller and Alexandra Beatty of Practical Strategy LLC, "Some employers say they are not only dissatisfied with the basic academic and technical skills of job seekers but also find that applicants and new hires lack the more general habits and competencies that characterize effective employees. Survey data and other research show that employers believe that recent high school graduates often lack skills such as punctuality, communication, problem solving, and willingness to accept supervision – in addition to appropriate levels of literacy and numeracy – that are recognized as critical both to an effective workplace and to an individual's successful entry into the world of work."

According to the National Association of Manufacturers, "every student should graduate from high school ready for work AND ready for college. CTE programs should require the ACT National Career Readiness Certificate to ensure graduates have the core academic and workplace competencies for employment." Employers who use

the CRC as a pre-screening tool, either posted in the job listing or specified on referrals from one-stop career centers or other employment agencies, benefit because they only interview candidates whose skill levels have been documented and certified. This raises the interviewing process to a new level with the elimination of basic skills testing or subjective assessment through the résumé or conversation.

According to Jan Bray, executive director, Association for Career and Technical Education (ACTE), "The National Career Readiness Certificate is an excellent way to assist career and technical educators in preparing the current and future workforce. Developing a skilled workforce—one that has the ability to quickly adapt to new and changing workforce demands—is a primary focus of the career and technical education programs offered through the nation's secondary and postsecondary public schools. Identifying, quantifying, and assessing those skills necessary to prepare the workforce is critical to career and technical education."

**Program Description**

The New Commonwealth Governor's STEM Academy is committed to fostering the Workplace Readiness Skills and competencies embedded in each VDoE approved CTE course curriculum offered to its students. The New Commonwealth Governor's STEM Academy will offer work readiness credentialing for soft and technical skills through the adoption of Virginia Workplace Readiness Skills Certification (WRS) and Virginia Career Readiness Certification (CRC) assessments for all program completers.

**Virginia Workplace Readiness Skills (WRS)**

The New Commonwealth Governor's STEM Academy will integrate WRS as a "soft" skill assessment for all program completing seniors; 500 – 600 students will participate in assessments annually. The WRS will test student competencies in the following 21 skill areas:

1. Positive Work Ethic
2. Integrity
3. Teamwork
4. Self-Representation
5. Diversity Awareness
6. Conflict Resolution
7. Creativity and Resourcefulness
8. Speaking and Listening
9. Reading and Writing
10. Critical Thinking and Problem Solving
11. Health and Safety
12. Organizations, Systems, and Climates
13. Lifelong Learning
14. Job Acquisition and Advancement
15. Time, Task, and Resource Management
16. Mathematics
17. Customer Service
18. Job-Specific Technologies
19. Information Technology
20. Internet Use and Security
21. Telecommunications

Students may earn a student-selected verified credit by passing this new examination while earning a standard credit in a related career and technical education course. Priority testing should be directed toward students who are graduating CTE completers. A certificate will be awarded to all students who pass the "Workplace Readiness Skills for the Commonwealth Examination."

**Virginia Career Readiness Certification (CRC)**

The New Commonwealth Governor's STEM Academy will integrate CRC as a technical skill assessment option for all seniors. In year two, seniors enrolled in Engineering Technology, Information Technology – CyberSecurity and Medical Assistant 2 will pilot the new CRC certification initiative; approximately 100 graduating seniors.

Today, the CRC is an industry validated and nationally recognized portable skills credential, assuring employers that a job applicant actually has the basic skills they seek.

The CRC measures the following skills:

- Problem solving, critical thinking, reading and using work-related text
- Applying information from workplace documents to solve problems
- Applying mathematical reasoning to work-related problems
- Setting up and performing work-related mathematical calculations
- Locating, synthesizing, and applying information that is presented graphically; comparing, summarizing, and analyzing information presented in multiple related graphics.

Companies that have used the WorkKeys® test have seen reduced turnover among employees, as well as improved productivity and training efficiency. In Fairfax County and Northern Virginia, Inova Health System is the largest private sector employer. In their hiring of entry-level allied health workers, Inova reported a turnover rate of 49 percent of these newly-hired entry-level employees because they did not possess the requisite soft skills and technical skills to perform their duties. Nor were their traditional human resources hiring practices able to identify successful entry-level candidates.

Inova integrated CRC into its human resources hiring practices and experienced significant results: there was a reduction in their turnover rate from 49 percent to 13 percent they experienced a savings of $1.2 million per 25 percent reduction in turnover; they realized a more efficient application process – and all resulted in improved patient care in their hospitals, free-standing emergency and outpatient centers. Other regional organizations who have integrated the CRC into their hiring practices include Washington Gas, Dominion Power, Lockheed Martin and Northrop Grumman.

The CRC is a powerful economic development tool. For an employer who may be contemplating moving his/her business to a new state or expanding an existing company, the skill level of the available work force is often a deciding factor. The CRC's Virginia Skills Bank is a searchable database yielding data on the varied skill levels of Virginia's work force for potential employers seeking to hire qualified workers.

On September 2, 2011, the Virginia Superintendent of Public Instruction issued Superintendent's Memo #243-11 on Virginia Career Readiness Assessments that both lowers the cost of CRC Certification per assessment, and outlines opportunities for high school students who complete a CTE program to take the CRC.

**CRC Successful Program Completion - Certification**

Students will be eligible to earn three levels of Career Readiness Certificates based on their test performance; Bronze, Silver or Gold. Working with the FCPS Office of Adult & Community Education (ACE), The New Commonwealth Governor's STEM Academy will pilot a secondary school-based WorkKeys Assessment Center in partnership with NOVA.

**CRC High School Implementation Plan**

| **Implementation Timeline** | |
|---|---|
| September | • Classroom/School presentations to introduce KeyTrain/CRC.<br>• Parent presentations will be conducted to familiarize them with the process. |
| October-November | • Students will take pretests in all three courses, one hour for each pretest is recommended. |
| December-January | • Students will meet individually with career coach to review pretest results and individual assignments. |
| January-March | • Students will continue to work on individual lessons during any allocated class time and Learning Seminars. |
| April | • Individual meeting with career coach to discuss progress and remediation if necessary. |
| May-June | • Eligible students will sit for the official WorkKeys CRC. Students will have same-day results.<br>• Résumé workshops will be offered to show students how to optimize their certifications and market themselves to potential employers. |

To ensure successful implementation of the WRS and CRC all stakeholders will be educated in the process and value of these assessments. The Academy's Career Experience Specialist will develop an educational campaign to be supported by the Dulles Regional Chamber of Commerce and a calendar of presentations/visits with area employers. Informational program brochures and ancillary materials will be created and provided to the students, parents, faculty and regional employers.

Scoring on each of the assessments will be evaluated; remediation programs will be developed to advance certification outcomes for years two and beyond. Remediation will be offered to students during non-class hours on weekdays and Saturdays.

## Work-Based Experience

The New Commonwealth Governor's STEM Academy will continue to be a great place *to discover a career*. We are committed to providing our students with a world-class academic and technical education that incorporates classroom learning and "real-world" work-based learning experiences. A full-time Career Experience Specialist works closely with Academy faculty, local industry, business, government, and centers of postsecondary and higher education to develop an annual program of high value experiential learning opportunities that foster career exploration and preparation. Current program offerings include:

**Internships** The Academy Career Experience Internship Program offers high-achieving juniors and seniors opportunities to advance classroom knowledge and gain "real-world" application experience in the workplace. Internships may be paid or unpaid; one to three days per week. Students are responsible for transportation to their internship sites.

*Internship Requirements:* In addition to maintaining a satisfactory attendance rate and a minimum 2.5 overall GPA, successful applicants maintain a minimum B average in their Academy courses. Students communicate their interest in making application to

the Career Experience Internship Program with their Academy teacher and request a formal application from the Office of the Career Experience Specialist.

Recent Internship partners include:

- Northrop Grumman Information Systems
- Department of Information Technology, Fairfax County Public Schools
- Department of Vehicle Services, Fairfax County Government
- Fairfax County Police and Sheriff's Departments
- area hospitals
- informational technology corporations
- small businesses
- private health care practices
- professional associations
- federal government agencies
- other private sector employers.

**Career Shadow Program** National Groundhog Job Shadow Day is presented each year in early February in collaboration with the Northern Virginia Technology Council (NVTC). Area businesses and corporations host Academy students at their workplaces. Matched with a professional for the day, students gain valuable information on a specific career of interest, an average business workday, educational pathways, and a potential future employer.

**Academy Entrepreneurial Businesses** Academy programs operate entrepreneurial businesses that provide students opportunities to perform jobs and services for external

clients and customers. These programs include Animal Science, Automotive Collision, Automotive Technology, Computer Systems Technology–A+, Cosmetology, and Culinary Arts.

***Additional high-value Career Experience programs include:***

**Workshops** The Academy offers students a variety of skill-building workshops. Topics include Career Planning, Résumé Preparation, Interviewing, and Personal Financial Management in "Reality Store" and the "ABC's of Credit." The latter two programs are offered in partnership with the Northwest Federal Credit Union.

**Classroom Speakers Series** Each year, classroom learning and career exploration is enhanced by special guest presentations made by regional and national industry leaders, science and technology professionals, specific career field experts, and current events speakers. The Academy will optimize the use of its video teleconferencing (VTC) technology to provide distance education through "live" classroom lectures by university faculty; ODU has VTC capabilities.

**Field Trips and Tours** Organized by teachers and the Career Experience Specialist, field trips and tours provide off-site and hands-on learning experiences. In recent years, Academy students have visited area colleges and universities; trade and industry schools; county, state, and federal government agencies; small businesses; local industry; medical/healthcare facilities; dental and veterinary practices; law enforcement agencies; and businesses in the hospitality industry.

**Special Events** Academy students have opportunities to participate in a number of career events, including "21st Century Careers in Medicine & Health Sciences"; "21st Century Careers in Construction"; National Engineers Week Celebration; Engineering EXPO & Engineering College Fair; Annual Career Fair; Academy Awards Ceremonies; and local, state and national conferences.

### Instructional Schedule

The Academy's instructional schedule maximizes instructional time on the traditional high school every other day 90 minutes/class block schedule. The Academy schedule has been modified, resulting in three class-scheduling variations:

- One-credit courses that meet every other day for 90 minutes
- Two-credit courses that meet every day during either the morning, mid-morning or afternoon sessions for 90 minutes each day
- Two-credit courses offered every other day that are double-blocked 180 minutes every other day. (This model maximizes lecture and "hands-on" practical application lab hours.)

(See Appendix F – Chantilly Academy – Bell Schedule)

## Infrastructure – Materials and Equipment

The New Commonwealth Governor's STEM Academy is co-located with Chantilly High School as a "school within a school." Chantilly High School is one of the division's most comprehensive high schools and offers specialized classrooms and laboratories that meet the "hands-on" educational, technological, and practical needs of a STEM Academy.

The original building was completed in 1976, and experienced capital improvement completed in 1996. Today, the physical plant is well maintained and provides the requisite classroom and laboratory space to support growing engineering technology and information technology programs in addition to the current programs offered.

The Academy's facilities include information technology and engineering labs equipped with standard prototyping labs that feature industrial material and processing tools and equipment.

The Academy currently incorporates 330 desktop and laptop computer workstations and an additional 78 laptop computers that are resident on three mobile computer carts to extend computer access to all classrooms. These critical information technology resources include an AutoCAD lab with 28 student workstations, classroom computer workstations, and servers that support student work separate from and in addition to the FCPS division's network, and two Information Technology classrooms (Computer Systems Technology, Cisco and Network Administration) that support lecture presentations and "hands-on" learning.

The NCGSA will have access to large presentation venues with its high school auditorium and lecture hall that will support formal student presentations, academic seminars, and special guest speakers for up to 600 students.

In 2011, Chantilly High School established an interactive video conferencing classroom that enables "real-time" Tandberg/Cisco video conferencing programs with special guest lecturers from distant college campuses, manufacturing centers, corporate centers, and connectivity with high schools elsewhere in the United States and abroad.

**Internal Evaluation Process**

The New Commonwealth Governor's STEM Academy Planning Committee, made up of representatives from K-12, postsecondary and higher education, business, and industry, is integral to the identification of strategic regional and statewide work force development requirements. The development of the Academy's new initiatives in Engineering Technology, Information Technology–Cybersecurity, and Career Readiness Certification will be managed by individual subcommittees for each of these initiatives.

The Committee will help to assure that our young people are prepared for high value, high demand sustainable careers that will assure the economic vitality of our region and the Commonwealth of Virginia.

In recognition of the individuals and their respective organizations represented on the Planning Committee, their commitments to the success of our Academy and contributions to the development of our Governor's Academy proposal, we have recommended that this cadre of stakeholders form the Advisory Committee. Each member has accepted this expanded role in support of the New Commonwealth Governor's STEM Academy.

The Advisory Committee will convene annually in August prior to the opening of the new academic year and prior to the close of the academic year in May to evaluate curriculum and provide oversight on rigor and relevance of our programs. Their agenda will be driven by the academic needs of our students, the ongoing needs for professional development for faculty, and work force requirements. Subcommittees for each of the new program areas will continue their efforts through additional meetings and virtual work groups.

A framework for assessment will be developed for use by the Advisory Committee. Survey instruments will incorporate student, parent, faculty, and employer feedback. The Advisory Committee will lead efforts for internal evaluation. Evaluation data will include a comprehensive review of student achievement (industry certifications, licenses earned, and dual enrollment credits awarded); postsecondary tracking of alumni; and student, parent and teacher survey evaluations. Working with Academy leadership, the Advisory Committee will evaluate program effectiveness and monitor progress to the achievement of agreed upon goals and objectives for the Governor's Academy.

The findings of the annual review will be analyzed and reported to FCPS and the Virginia Department of Education. The findings will address student achievement, postsecondary student plans, progress on meeting the Academy's stated goals, and their alignment with strategic work force demands.

**Sustainability of the New Commonwealth Governor's STEM Academy**

The New Commonwealth Governor's STEM Academy will build on the successes of the Chantilly Academy and its current funding levels, which include Perkins federal funds and an allocation of division funds to support its educational mission. The New Commonwealth Governor's STEM Academy has an administrative staff with expertise in institutional development and fundraising in K–12 and higher education. In the past six years, more than $250,000 in grants and donations (external funding) have been secured to advance Chantilly Academy's curriculum, classrooms, and laboratories. Working with Academy leadership, The New Commonwealth Governor's STEM Academy Advisory Committee will further support the program though expanded business contacts and resource identification. These additional resources—both financial and in-kind—will help to assure the Academy's capacity to serve the programmatic needs of students and faculty.

## Administrative Procedures

### Partnerships

Chantilly Academy has excelled in its efforts to form meaningful partnerships with stakeholders in all sectors—postsecondary/higher education, industry and business and government—to advance Career & Technical Education. Numerous examples of the Academy's partnership initiatives have been cited in the *Introduction* and *Rationale* sections and elsewhere in this proposal.

The New Commonwealth Governor's STEM Academy enrollment eligibility will be expanded to serve students from all 24 of the high schools and secondary schools, 4 Alternative High Schools, 2 Career Centers, and 2 Public Day Schools. The New Commonwealth Governor's STEM Academy will continue to offer enrollment to students from the Contract Services School in our community.

**Pupil Placement at the New Commonwealth Governor's STEM Academy -** In addition to the school divisions' extensive bus transportation program, a parent or guardian residing in Fairfax County may request a student transfer for his or her high school student to Chantilly High School and **New Commonwealth Governor's STEM Academy** for the following school year during transfer session. Students must be enrolled in the base school before starting the application process.

With the shared goal of Academy students' successful transition to postsecondary training or higher education, work force, and/or a four-year university, the stakeholders that are represented on the Advisory Committee will develop an annual work plan that will address opportunities for collaboration in curriculum development, classroom and laboratory improvements, work-based experiences for students, professional development, student employment, and scholarship opportunities for Academy graduates.

**Student Recruitment, Selection Criteria and Admissions**

**New Commonwealth Governor's STEM Academy** courses will be offered to all students in the Fairfax County Public Schools who will be classified as juniors, seniors or

postsecondary students working towards a Standard High School Diploma for the upcoming school year. The Academy programs will offer enrollment to outstanding and academically advanced sophomores, including Engineering, and Information Technology. The **New Commonwealth Governor's STEM Academy** will conduct a robust annual student recruitment program to encourage enrollment.

Beginning in January of each year, the Academy's Counselor, faculty and staff will visit the Departments of Student Services at all of the high and secondary schools**,** Career Centers, Public Day Schools and Alternative High Schools to brief directors and counselors on the New Commonwealth Governor's STEM Academy, plans for the new academic year, application procedures, and timelines for admission. The New Commonwealth Governor's STEM Academy will continue to participate in an annual CTE central office special event, **"Camp CTE,"** that will recruit middle, high, and secondary school counselors and students to tour the New Commonwealth Governor's STEM Academy to gain first-hand awareness and "hands-on" experience. Additionally, Academy staff and faculty, and students will participate in **annual elective fairs** at all high and secondary schools**,** Career Centers, Public Day Schools, Alternative Learning Centers and Contract Services School.

Prospective students and parents will be invited to visit the New Commonwealth Governor's STEM Academy during annual **Open House** recruitment programs, curriculum nights, and back-to-school night programs. Additionally, prospective students will be invited to sit in on courses of interest for enrollment. High school counselors will provide logistical support and instructions, visitor passes, and New

Commonwealth Governor's STEM Academy bus scheduling for interested students. The New Commonwealth Governor's STEM Academy will place advertisements in Fairfax County Public Schools' newspapers to promote the Academy.

New Commonwealth Governor's STEM Academy application packets will be managed by each school's counselors. The packets will include application instructions and information on required documents: formal application form, student essay, attendance record, and school transcript. Applications will be reviewed for completeness by school counselors and forwarded to the New Commonwealth Governor's STEM Academy. The application deadline will be in late March of each year.

**Code of Conduct and Attendance Policies**

Student code of conduct at the Academy is set by the FCPS policy statement titled ***Student Rights and Responsibilities (SR&R)*** which is signed annually by all Academy students. They also sign an additional copy of the SR&R at their base high schools. The SR&R requires both student and parent signatures, and students are tested on key principles cited in the document.

The Appropriate Use of Fairfax County Public Schools' Network and Internet Resources (**Regulation 6410.13)** defines the *acceptable use* educational objectives and security requirements for the use of Internet resources and network services by FCPS. This regulation covers all users of FCPS network services. The Acceptable Use Policy (AUP) is

a contract signed by parents and students—guidelines for FCPS staff members and contractors—that sets the rules for using the FCPS network.

**Parent Communications** There is a minimum expectation that all teachers e-mail parents (and provide students) with an IGPro class progress report, a minimum of once between the first of the quarter and interim time, and once again between interim and the end of the quarter. Chantilly High School and Chantilly Academy teachers are required to provide bi-weekly grades sheets to the parents of all students.

**Grading** If a student is earning a grade of "D" or "F" at interim time or as a quarter grade, teachers must call and speak with the parent and document the date of the call (leaving a message is not considered parent contact). If a teacher chooses to contact the parent via e-mail, he or she must save the e-mail and the parent's response because evidence must be available that the parent received the teacher's e-mail communication. If a grade of D/F is issued on a report card, the teacher must complete/select a "comment" on the student's report card.

**Attendance** Teachers receive daily attendance data on their classes from the Academy's attendance officer. Teachers are the first line of action when working with student attendance. They are required to contact the student's home and speak with the parents of all students with attendance problems. If there is a language issue when calling a student's home, the Academy's ESOL Support Team may provide language service assistance. The Academy counselor is available to support teacher contacts,

by locating a working telephone number for parents and responding to parents' questions on student attendance and behavior.

**Transportation**

Student transportation requests will be processed at the New Commonwealth Governor's STEM Academy. Fairfax County Public Schools bus transportation will be provided from all high and secondary schools, Career Centers, Public Day Schools and Alternative High Schools based on a minimum enrollment of five students per session from a school or center to the New Commonwealth Governor's STEM Academy.

Additionally, if bus transportation is not available, New Commonwealth Governor's STEM Academy student parking will be available and parking permits will be awarded. Priority student parking consideration will be given to students that are unable to take advantage of the bus transportation to and from the New Commonwealth Governor's STEM Academy.

**Participating Schools in the New Commonwealth Governor's STEM Academy:**

**High Schools & Secondary Schools**

| | |
|---|---|
| Annandale High School | Marshall High School |
| Centreville High School | McLean High School |
| Chantilly High School | Mount Vernon High School |
| Edison High School | Oakton High School |
| Fairfax High School | Robinson Secondary School |
| Falls Church High School | South County Secondary School |

| | |
|---|---|
| Hayfield Secondary School | South Lakes High School |
| Herndon High School | Stuart High School |
| Lake Braddock Secondary School | West Potomac High School |
| Langley High School | West Springfield High School |
| Lee High School | Westfield High School |
| Madison High School | Woodson High School |
| **Alternative High Schools** | |
| Bryant Alternative Learning Center | Mountain View Alternative High School |
| Landmark Career Academy | Woodson Adult High School |
| **Career Centers** | |
| Davis Center | Pulley Center |
| **Public Day Schools** | |
| Cedar Lane Center | Quander Road Center |

**Faculty Recruitment/Selection/Assignment**

The New Commonwealth Governor's STEM Academy is tied to the procedures outlined by the Human Resources Department of Fairfax County Public Schools to identify, recruit, select, and assign faculty members for Academy teaching appointments. Interviewing panels for faculty positions may include the Coordinator of Career and Technical Education, the Academy's Administrator, individual CTE Program Managers, and other faculty/staff. Selection for teaching appointments will take into consideration the criteria for acceptance by NOVA as an adjunct faculty member to optimize the dual enrollment program at the Academy.

**Staff Development**

Fairfax County Public Schools are committed to professional staff development and offers a comprehensive staff development program to advance best practices and promote educational research, use of instructional technologies, and individualized instruction methodologies that support achievement for all students. FCPS offers in-service programs throughout the school year within CTE program disciplines and overall as a professional learning community.

In preparation for the expansion of the Academy's career pathways in Engineering Technology and Information Technology - CyberSecurity, faculty members will benefit from mentorship by secondary/higher education faculty, and subject matter experts in industry and government.

The Academy will continue a strong commitment to its program of Professional Learning Communities (PLC) and weekly scheduled staff development time built into its school day on Thursdays of each week for forty-five minutes.

**Staff Evaluation**

The New Commonwealth Governor's STEM Academy will utilize the guidelines and procedures established by FCPS and outlined in the division's policy manual in the review/evaluation of all faculty and staff. The major components of the process include the following: the five standards of performance, the performance guidelines and expectations, the evaluation cycle, assessment and evaluation procedures, the self-assessment, midyear assessment, final evaluation and the intervention process.

The assessment and evaluation process for all teacher-scale employees is based on the belief that evaluation is a positive experience for encouraging professional growth and an essential element in the improvement of instruction.

The process accomplishes the following:

- Offers professional growth opportunities for all teachers
- Provides support for teachers and administrators
- Recognizes teaching performance that exceeds guidelines/expectations
- Gives special assistance to teachers with conditional reappointments
- Identifies teachers not meeting guidelines/expectations.

The five **standards of performance** for teachers are used by evaluators and teachers in the assessment and evaluation process. These standards state what is expected of teachers in Fairfax County Public Schools. All standards are essential to successful performance. Guidelines and expectations accompany standards and provide a framework for how each standard can be met. The standards of performance are Planning and Assessment, Instruction, Learning Environment, Human Relations and Communication Skills, and Professionalism.

**Student, Parent, and Community Investment**

Student, parent, and community investment is deeply rooted in the CTE educational mission at Chantilly Academy. There is a heightened understanding that all stakeholders must work together if we are to realize student achievement and

effectively respond to our work force development challenge in the region and across our Commonwealth.

The existing Engineering program at Chantilly Academy has been the beneficiary of countless hours of volunteer support from professional women in engineering through their service as one-on-one mentors for Girls Exploring Engineering - $GE^2$. Over the past five years, more than 200 female professional engineers from the public and private sectors have recorded more than 3,000 volunteer hours in $GE^2$ mentorship that has fostered engineering and STEM career exploration.

Each year in late February, engineers in the community join with Academy engineering students to celebrate National Engineers Week. Their sponsoring employers have included:

- Micron Technology
- NOBLIS
- Lockheed Martin
- Inova Health System–Technical Dynamics Inc.
- The National Reconnaissance Office
- Patton Harris and Rust
- Atkins Global
- James Madison University
- Northrop Grumman
- Virginia Technical Institute and State University
- Dewberry

- The George Washington University
- University of Maryland–Baltimore and College Park Campuses
- US Naval Research Laboratory–Carderock Division

Public and private sector engineering workplaces have sponsored our Annual Engineering EXPO & Engineering College Fair, job shadows, internships, and Independent Research–Engineering placements for our seniors. Local corporations have made annual investments in engineering co-curricular activities, including FIRST Robotics–Chantilly Robotics 612, IEEE Student Club, TSA, and the NASA Student Launch Initiative.

The 2011 Engineering EXPO & Engineering College Fair welcomed faculty, current students and alumni from 15 engineering schools in Virginia and elsewhere in the country and included:

- Auburn University
- George Mason University
- George Washington University
- James Madison University
- Johns Hopkins University
- Norfolk State University
- Northern Virginia Community College
- Old Dominion University
- Olin College of Engineering
- Purdue University

- University of Maryland–College Park
- Villanova University
- Virginia Commonwealth University
- Virginia Polytechnic Institute and State University
- West Virginia University

Corporate and government exhibitors at the EXPO included:

- Atkins Global
- ExxonMobil
- L-3 Global Security & Engineering Solutions
- Micron Technology
- Mitre Corporation
- NASA Headquarters
- NOBLIS
- Northrop Grumman Information Systems
- The Office of the Undersecretary of Defense for Acquisition
- Technology and Logistics, SRC Inc.
- The SI Organization
- United States Department of Transportation
- Water Environment Federation.

Chantilly Academy parents are fully engaged in the engineering learning experience. They serve as mentors and chaperones for FIRST Robotics, and NASA's Student Launch Initiative that requires extensive work with NASA engineers. Last year, Academy

students and parent chaperones travelled to NASA Marshall Space Flight Center, in Huntsville, Alabama, to launch their student-designed and built high-powered rocket.

As evidence of their growing commitment, Academy parents have recently formed a Chantilly Robotics 612 Booster Club and have assumed the major leadership role for this extra-curricular activity that annually engages more than 60 engineering students in the annual FIRST Robotics Challenge Competition.

In Information Technology, students and parent chaperones and community mentors are engaged in their second year of the Air Force Association's CyberPatriot Competition. One All Services Division team of AFJROTC cadets and four Open Division Teams of engineering, computer science, and information technology students (total students 57) participated in the 2012 CyberPatriot IV Competition. Corporate cybersecurity professionals from Northrop Grumman and SRC Inc., serving as mentors and volunteers from the Air Force Association Gabriel Chapter in Northern Virginia, complemented six faculty and staff sponsors.

**Insurance Documentation**

Fairfax County Public Schools maintains a comprehensive program of insurance/self-insurance for its property and liability exposures. Fairfax County Public Schools does not provide individual health insurance to students but makes a voluntary student insurance program available for purchase through an outside vendor. Fairfax County Public Schools is insured by the Virginia Municipal Liability Pool Insurance Program for property, liability, and auto insurance (See Appendix G).

**Budget Narrative**

The New Commonwealth Governor's STEM Academy builds on the Academy's current CTE programs and optimizes existing qualified faculty, classroom, and laboratory resources. In the light of current fiscal realities for our school division, every effort has been made to enrich program offerings within existing Academy budget parameters and optimize strong working relationships, philanthropic support, and in-kind donations from postsecondary training and higher education, industry and government, and trade associations. For this proposal, Micron Technology Foundation, which has funded engineering education at Chantilly Academy for the past five years, will continue its corporate support for the existing Engineering program and the new Engineering Technology program area. Other organizations will be approached to provide funding, as well as volunteers and other vital programmatic resources. One of the strengths of the Chantilly Academy has been the willingness of area businesses and organizations to contribute in many ways to achieve the educational goals of the Academy, and this high level of regional commitment to the success of the program is expected to continue. In-kind contributions from our partners, including participation in the Advisory Committee—although anticipated as being significant investments of time on the part of the committee members—have not been valued for this application.

**Personnel** Each of the following four new, dual enrolled Academy courses requires an additional 0.17 FTE position; the salaries will be paid by FCPS through the re-allocation of existing non-ratio Academy staffing.

| Personnel | | |
|---|---|---|
| **Course Title** | **FTE** | **Salary** |
| ETR 113 DC Fundamentals | 0.17 | $9,001.87 |
| ETR 106 Basic Programming | 0.17 | $9,001.87 |
| ITN 120 Wireless Network Administration | 0.17 | $9,001.87 |
| ITN 260 Network Security Basics | 0.17 | $9,001.87 |
| **Total Salaries** | | **$36,007.48** |

The personnel costs were calculated based on the following assumptions:

- Costing is for a standard FCPS teaching contract of 194 days and assumes a teacher with a bachelor's degree and 15 years of experience at pay step 7.
- The position is for FY 2014 (July 2013 to June 2014).
- The budget assumes an annual cost-of-living increase of two percent.

**Benefits** Total benefits for the four 0.17 FTE instructor positions, based on FY 2013's average benefit rate of 43.8 percent, are estimated at $15,771.28.

**Staff Development** If this proposal is accepted, $3,000 of the total $5,000 awarded to FCPS by the Commonwealth of Virginia will be used to support professional development opportunities that will be determined by the needs of the program and instructional personnel.

**Materials and Supplies** Funding for anticipated materials and supplies will come from three sources:

- Perkins—Perkins currently funds testing for NOCTI workplace readiness. These same funds will be re-allocated to testing for CRC Certifications of up to 600 seniors at $30 each for an estimated cost of $18,000.
- Other Funds
    - Commonwealth of Virginia—If this proposal is accepted, $2,000 of the $5,000 awarded from the state shall be used to fund CPTAE or VCATS certifications for an estimated 20 students annually at $100 per certification.
    - Micron Technology Foundation—Micron Technology Foundation has donated $4,000 toward the Engineering-Technology-Advanced Manufacturing program.
- Chantilly Academy—The Academy's annual Operating Budget (Perkins & FCPS Division Funding) of $58,918.83 in SY 2011–2012 will provide classroom and laboratory resources for up to $10,000 per school year. Local textbook funds will cover expenses for adopted textbooks for new courses.

The following chart summarizes Materials and Supplies by funding source:

| Materials and Supplies | | | | |
|---|---|---|---|---|
| **Item** | **Perkins** | **Commonwealth of Virginia** | **Micron Technology Foundation** | **Chantilly Academy** |
| CRC Certifications | $18,000.00 | $0.00 | $0.00 | $0.00 |
| VCATS Manufacturing Certifications | $0.00 | $2,000.00 | $0.00 | $0.00 |
| Miscellanous Materials and Supplies | $0.00 | $0.00 | $4,000.00 | $10,000.00 |
| **Total by Source of Funding** | $18,000.00 | $2,000.00 | $4,000.00 | $10,000.00 |

## Summary

Academy Administration, faculty, and staff of the Chantilly Academy; FCPS CTE leadership; and the distinguished members of the New Commonwealth Governor's

STEM Academy Advisory Committee share a strong commitment to forging a new model for world-class secondary education in two relevant, high value STEM careers: Engineering Technology and Information Technology–Cybersecurity. All equally recognize the importance of their efforts to assure that the Academy prepare all of its graduates for a successful entrance to the workplace and postsecondary education through Workplace Readiness Skills (WRS) Certification and Career Readiness Certification (CRC).

This collaboration will be a major proponent of curriculum innovation, work-based learning experiences for students; professional development for teachers; effective student, parent, and general community education on career pathways in Engineering Technology and Information Technology–Cybersecurity; and postsecondary and higher education planning.

The goal of the NCGSA will be to optimize the role that CTE programs have played and will continue to play in student retention and four year on-time graduation, and in the percentage of our graduates enrolling in postsecondary education at Northern Virginia Community College, Old Dominion University, Norfolk State University, and other distinguished centers of postsecondary training and higher education in Virginia.

The New Commonwealth Governor's STEM Academy will serve as an innovator and incubator of new programs and educational technology and will be an active ambassador on "the art of the possible" in Career & Technical Education that advances STEM education across the Commonwealth of Virginia and our nation.

# Appendices

# Appendix A:
# Planning and Advisory Committee Members

## Planning & Advisory Committee
## New Commonwealth Governor's STEM Academy
## (Chantilly Academy)

### Roster of Members

Dr. Zacharias Albin
Chair, Department of Engineering
College of Science, Engineering & Technology
Norfolk State University

Dr. Carray Banks, Jr.
Department Head, Technology Department
College of Science, Engineering & Technology
Norfolk State University

Dr. Bruce Bowman
Dean, Division for Science, Technology & Business
Northern Virginia Community College – Alexandria Campus

Ruthe D. Brown
Director, Dual Enrollment & Tech Prep
Northern Virginia Community College

Tony Casipit
Manager, Technology Education
Fairfax County Public Schools

Eileen Curtis
President & CEO
Dulles Regional Chamber of Commerce

Patti DeiTos, MSN, RN-BC, PWD
Curriculum Director, Military to Medicine®
Inova Health System

Katherine A. DeRosear
Director of Workforce Development, Virginia Manufacturers Association
Executive Director, Virginia Council on Advanced Technology Skills
Virginia Manufacturers Association

Lindsay Diles
Community Relations Representative
Northrop Grumman Information Systems

Elizabeth Downey
Coordinator, Career & Technical Education
Fairfax County Public Schools

Kevin Doyle
Director, Cyber Programs
SRC Inc.

Craig Howerter
CyberSecurity Representative
Office of Under Secretary of Defense
Acquisition, Technology and Logistics
Department of Defense – U.S. Pentagon

Doug Huneycutt
Chief Technologist, Cybersecurity and Net Centric Technologies
The SI Organization

Teresa Johnson
Principal
Chantilly High School - Fairfax County Public Schools

Ray Kinard
Director, Cyber Academy
Northrop Grumman Information Systems

Dr. Darius "Dee" Martin
Dean, Division of Science and Applied Technologies
Northern Virginia Community College – Manassas Campus

Megan McLaughlin
Workforce Development Manager
Micron Technology, Inc.

Carlos Niederstrasser
Senior Principal Systems Engineer
Coordinator - University Relations & Community Outreach
Orbital Sciences Corporation

Joan Ozdogan
Career Experience Specialist
Chantilly Academy - Fairfax County Public Schools

Professor Charlene Phillips
Assistant Division Dean for Information Technology
Northern Virginia Community College – Manassas Campus

Sharon N. Robertson
Associate Vice President for Academic Services
Northern Virginia Community College

Jeff Schlegel
Operations Senior Manager, MS2 - Manassas
Lockheed Martin Corporation

Zuzana Steen
University and Academic Relations Manager
Micron Technology, Inc.

Mileta M. Tomovic, Ph.D.
Professor and Department Chair
Department of Engineering Technology
F. Batten College of Engineering and Technology
Old Dominion University

Douglas R. Wright
Administrator, Chantilly Academy
Assistant Principal, Chantilly High School
Fairfax County Public Schools

Advisory Committee Certification

The New Commonwealth Governor's Academy

Advisory Committee Member Agreement

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4. Provide stewardship for the oversight of programs and course objectives to assure alignment with postsecondary/higher education and the regional workforce.
5. Provide ongoing evaluation of the programs, courses and co-curricular initiatives to assure achievement of the Academy's critical educational mission.
6. Serve as an Ambassador of the New Commonwealth Governor's Academy to the general community, business/industry and government.

Name: DR. SACHARIA ALBIN

Title: PROFESSOR & CHAIR

School/Institution/Organization: DEPT. OF ENGINEERING NORFOLK STATE UNIVERSITY

My signature below certifies my willingness to be an active member on the Combined Planning and Advisory Committee for the proposed New Commonwealth Governor's Academy described in detail in the accompanying application for this distinguished designation.

Allen S

(Signature)

7/9/12

(Date)

## Advisory Committee Certification

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Name: Dr. Carray Banks, Jr.

Title: Department Head, Department of Technology

School/Institution/Organization: Norfolk State University

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Carray Banks Jr. 2/17/2012

*(Signature)* *(Date)*

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Name: BRUCE A. BOWMAN

Title: DEAN, DIVISION OF SCIENCE, TECHNOLOGY & BUSINESS

School/Institution/Organization: NORTHERN VIRGINIA COMMUNITY COLLEGE

My signature below certifies my willingness to be an active member on the Combined Planning and Advisory Committee for the proposed New Commonwealth Governor's Academy described in detail in the accompanying application for this distinguished designation.

Bruce A. Bowman — 16 FEB 2012

*(Signature)* *(Date)*

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Name: Ruthe D. Brown

Title: Director, Dual Enrollment

School/Institution/Organization: NOVA

My signature below certifies my willingness to be an active member on the Combined Planning and Advisory Committee for the proposed New Commonwealth Governor's Academy described in detail in the accompanying application for this distinguished designation.

Ruthe D. Brown — 2/17/12

*(Signature)* *(Date)*

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Name: Tony Cuccipiti

Title: Program Manager Technology + Engineering Education

School/Institution/Organization: Fairfax County Public Schools

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(Signature)

13 Feb 2012

(Date)

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Name: Eileen Curtis

Title: President

School/Institution/Organization: Dulles Regional Chamber

My signature below certifies my willingness to be an active member on the Combined Planning and Advisory Committee for the proposed New Commonwealth Governor's Academy described in detail in the accompanying application for this distinguished designation.

Eileen Curtis — *(Signature)*

2/16/12 — *(Date)*

Advisory Committee Certification

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6. Serve as an Ambassador of the New Commonwealth Governor's Academy to the general community, business/industry and government.

Name: Patricia DeiTos

Title: Curriculum Director, Military to Medicine Program

School/Institution/Organization: Inova Health System

My signature below certifies my willingness to be an active member on the Combined Planning and Advisory Committee for the proposed New Commonwealth Governor's Academy described in detail in the accompanying application for this distinguished designation.

(Signature) February 9, 2012 (Date)

Advisory Committee Certification

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Name: Katherine A. DeRosear

Title: Director of Workforce Development

School/Institution/Organization: Virginia Manufacturers Association

My signature below certifies my willingness to be an active member on the Combined Planning and Advisory Committee for the proposed New Commonwealth Governor's Academy described in detail in the accompanying application for this distinguished designation.

Katherine A. DeRosear

(Signature)

2-14-12

(Date)

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Name: LINDSAY DILES

Title: Community Relations Rep

School/Institution/Organization: NORTHROP GRUMMAN

My signature below certifies my willingness to be an active member on the Combined Planning and Advisory Committee for the proposed New Commonwealth Governor's Academy described in detail in the accompanying application for this distinguished designation.

(Signature)

2/14/12

(Date)

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Name: Elizabeth Downey

Title: Coordinator, CTE

School/Institution/Organization: FCPS

My signature below certifies my willingness to be an active member on the Combined Planning and Advisory Committee for the proposed New Commonwealth Governor's Academy described in detail in the accompanying application for this distinguished designation.

Elizabeth Downey (Signature)

12-14-2012 (Date)

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Name: KEVIN J. DOYLE

Title: DIRECTOR, CYBER PROGRAMS

School/Institution/Organization: SRC, Incorporated

My signature below certifies my willingness to be an active member on the Combined Planning and Advisory Committee for the proposed New Commonwealth Governor's Academy described in detail in the accompanying application for this distinguished designation.

Kevin J Doyle
*(Signature)*

Feb 16, 2012
*(Date)*

OFFICE OF THE UNDER SECRETARY OF DEFENSE
3000 DEFENSE PENTAGON
WASHINGTON, DC 20301-3000

ACQUISITION
TECHNOLOGY
AND LOGISTICS

February 15, 2012

Mr. Douglas Wright
Administrator
Chantilly Academy
4201 Stringfellow Road
Chantilly, Virginia 20151

Dear Mr. Wright:

Thank you for the invitation to participate with your new academic initiative in support of CyberSecurity education and careers at the New Commonwealth Governor's Academy. The Department of Defense has operational organizations that establish, operate, maintain and defend networks and conduct full-spectrum operations in cyberspace.

We hope that your current and future Information Technology – CyberSecurity students will consider joining our government workforce in the future. Congratulations to your students, faculty and mentors on taking two Chantilly Academy CyberPatriot teams all the way to the 2012 National Semi-Finals.

I will serve as your Government Representative Contact on all CyberSecurity issues. As this Representative, we will share our views of CyberSecurity to your Advisory Committee and help enrich your Information Technology – CyberSecurity education program. Additionally in this capacity, I will provide outreach to other Government Agencies to identify guest speakers and their agency's insights into CyberSecurity.

We wish you the best in gaining this new stature within Virginia's K12 educational community and plan to actively contribute to its success. We are indeed honored to be invited to participate along with the numerous colleges and organizations that you have gathered to support this critical information technology and engineering challenge facing our nation. Thank you for considering us among the elite in CyberSecurity.

Sincerely,

Craig Howerter

Craig Howerter
OUSD(AT&L)ARA
CyberSecurity Representative

cc: Mr. Philip D. Rodgers
Joan Ozdogan, Chantilly Academy

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Name: Douglas S. Huneycutt, Sr.

Title: Chief Technologist, Cybersecurity / Net Centric Technologies

School/Institution/Organization: The SI Organization, Inc.

My signature below certifies my willingness to be an active member on the Combined Planning and Advisory Committee for the proposed New Commonwealth Governor's Academy described in detail in the accompanying application for this distinguished designation.

Douglas S. Huneycutt, Sr. — 13 February 2012

*(Signature)* *(Date)*

Advisory Committee Certification

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Name: Ms. Teresa Johnson

Title: Principal

School/Institution/Organization: Chantilly High School, Fairfax County Public Schools

My signature below certifies my willingness to be an active member on the Combined Planning and Advisory Committee for the proposed New Commonwealth Governor's Academy described in detail in the accompanying application for this distinguished designation.

Teresa L Johnson 2-24-12

*(Signature)* *(Date)*

## Advisory Committee Certification

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Name: Raymond Kinard

Title: Director, Cyber Academy

School/Institution/Organization: Northrop Grumman Corp.

My signature below certifies my willingness to be an active member on the Combined Planning and Advisory Committee for the proposed New Commonwealth Governor's Academy described in detail in the accompanying application for this distinguished designation.

Raymond Kinard

*(Signature)*

02/13/2012

*(Date)*

Advisory Committee Certification

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Name: Daniel D. Martin

Title: Dean

School/Institution/Organization: NOVA/Manassas Campus

My signature below certifies my willingness to be an active member on the Combined Planning and Advisory Committee for the proposed New Commonwealth Governor's Academy described in detail in the accompanying application for this distinguished designation.

(Signature) 02/16/12 (Date)

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3. Evaluate current classroom and laboratory facilities to assure achievement of learning objectives.
4. Provide stewardship for the oversight of programs and course objectives to assure alignment with postsecondary/higher education and the regional workforce.
5. Provide ongoing evaluation of the programs, courses and co-curricular initiatives to assure achievement of the Academy's critical educational mission.
6. Serve as an Ambassador of the New Commonwealth Governor's Academy to the general community, business/industry and government.

Name: Megan McLaughlin

Title: Workforce development Manager

School/Institution/Organization: Micron Technology

My signature below certifies my willingness to be an active member on the Combined Planning and Advisory Committee for the proposed New Commonwealth Governor's Academy described in detail in the accompanying application for this distinguished designation.

Megan McLaughlin — 2/10/12

*(Signature)* *(Date)*

## Advisory Committee Certification

## The New Commonwealth Governor's Academy

### Advisory Committee Member Agreement

Key to the success of the New Commonwealth Governor's Academy (Fairfax County Public Schools) is an actively engaged and knowledgeable Advisory Committee of representatives from industry, business, postsecondary and higher education and government.

As a member of the Advisory Committee, I will effectively:

1. Assist in the development of Academy programs; goals and objectives.
2. Contribute to the Academy's awareness of the strategic workforce needs of the region and education/training requirements.
3. Evaluate current classroom and laboratory facilities to assure achievement of learning objectives.
4. Provide stewardship for the oversight of programs and course objectives to assure alignment with postsecondary/higher education and the regional workforce.
5. Provide ongoing evaluation of the programs, courses and co-curricular initiatives to assure achievement of the Academy's critical educational mission.
6. Serve as an Ambassador of the New Commonwealth Governor's Academy to the general community, business/industry and government.

**Name:** ___Carlos G. Niederstrasser_____

**Title:** _____Senior Principal Engineer_____

**Area Distribution/Organization:** _Orbital Sciences Corporation_____

My signature below certifies my willingness to be an active member on the Combined Planning and Advisory Committee for the proposed New Commonwealth Governor's Academy described in detail in the accompanying application for this distinguished designation.

_____ ___15 February 2012_____

(Signature) (Date)

Advisory Committee Certification

The New Commonwealth Governor's Academy

Advisory Committee Member Agreement

Key to the success of the New Commonwealth Governor's Academy (Fairfax County Public Schools) is an actively engaged and knowledgeable Advisory Committee of representatives from industry, business, postsecondary and higher education and government.

As a member of the Advisory Committee, I will effectively:

1. Assist in the development of Academy programs; goals and objectives.
2. Contribute to the Academy's awareness of the strategic workforce needs of the region and education/training requirements.
3. Evaluate current classroom and laboratory facilities to assure achievement of learning objectives.
4. Provide stewardship for the oversight of programs and course objectives to assure alignment with postsecondary/higher education and the regional workforce.
5. Provide ongoing evaluation of the programs, courses and co-curricular initiatives to assure achievement of the Academy's critical educational mission.
6. Serve as an Ambassador of the New Commonwealth Governor's Academy to the general community, business/industry and government.

Name: Joan K. Ozdogan

Title: Career Experience Specialist

School/Institution/Organization: Chantilly Academy, Fairfax County Public Schools

My signature below certifies my willingness to be an active member on the Combined Planning and Advisory Committee for the proposed New Commonwealth Governor's Academy described in detail in the accompanying application for this distinguished designation.

*(Signature)*

February 21, 2012

*(Date)*

Advisory Committee Certification

The New Commonwealth Governor's Academy

Advisory Committee Member Agreement

Key to the success of the New Commonwealth Governor's Academy (Warren County Public Schools) is an actively engaged and knowledgeable Advisory Committee of representatives from industry, business, postsecondary and higher education and government.

As a member of the Advisory Committee, I will (initial each):

1. Assist in the development of Academy programs, goals and objectives.

2. Contribute to the Academy's awareness of the changing workforce needs of the region and emerging requirements.

3. Evaluate current resources and laboratory facilities to ensure achievement of learning objectives.

4. Provide stewardship for the oversight of programs and course objectives to ensure alignment with postsecondary/higher education and the regional workforce.

5. Provide ongoing evaluation of the program, courses and curriculum initiatives to ensure achievement of the Academy's stated educational mission.

6. Serve as an Ambassador of the New Commonwealth Governor's Academy to the general community, business/industry and government.

Name: Dr. Charlene Phillips (cphillips@nccc.edu)

Title: Assistant Division Dean, Computer Science and Information Tech

School/Institution/Organization: Northampton Community College

My signature below confirms my willingness to be an active member on the Certificated Planning and Advisory Committee for the proposed New Commonwealth Governor's Academy described in detail in the accompanying application for the distinguished designation.

Dr Charlene Phillips — 4/26/12

(Signature) (Date)

Advisory Committee Certification

The New Commonwealth Governor's Academy

Advisory Committee Member Agreement

Key to the success of the New Commonwealth Governor's Academy (Fairfax County Public Schools) is an actively engaged and knowledgeable Advisory Committee of representatives from industry, business, postsecondary and higher education and government.

As a member of the Advisory Committee, I will effectively:

1. Assist in the development of Academy programs: goals and objectives.

2. Contribute to the Academy's awareness of the strategic workforce needs of the region and education/training requirements.

3. Evaluate current classroom and laboratory facilities to assure achievement of learning objectives.

4. Provide stewardship for the oversight of programs and course objectives to assure alignment with postsecondary/higher education and the regional workforce.

5. Provide ongoing evaluation of the programs, courses and co-curricular initiatives to assure achievement of the Academy's critical educational mission.

6. Serve as an Ambassador of the New Commonwealth Governor's Academy to the general community, business/industry and government.

Name: Sharon N. Robertson

Title: Associate Vice President for Academic Services

School/Institution/Organization: Northern Virginia Community College

My signature below certifies my willingness to be an active member on the Combined Planning and Advisory Committee for the proposed New Commonwealth Governor's Academy described in detail in the accompanying application for this distinguished designation.

Sharon N. Robertson
*(Signature)*

2/13/12
*(Date)*

## Advisory Committee Certification

### The New Commonwealth Governor's Academy

### Advisory Committee Member Agreement

Key to the success of the New Commonwealth Governor's Academy (Fairfax County Public Schools) is an actively engaged and knowledgeable Advisory Committee of representatives from industry, business, postsecondary and higher education and government.

As a member of the Advisory Committee, I will effectively:

1. Assist in the development of Academy programs, goals and objectives.
2. Contribute to the Academy's awareness of the strategic workforce needs of the region and education/training requirements.
3. Evaluate current classroom and laboratory facilities to ensure achievement of learning objectives.
4. Provide stewardship for the oversight of programs and course objectives to assure alignment with postsecondary/higher education and the regional workforce.
5. Provide ongoing evaluation of the programs, course and co-curricular initiatives to assure achievement of the Academy's critical educational mission.
6. Serve as an Ambassador of the New Commonwealth Governor's Academy to the general community, business/industry and government.

Name: Jeff Schlegel

Title: Operations Site Manager – Manassas VA

**School/Institution/Organization:** Lockheed Martin – MS2

My signature below certifies my willingness to be an active member on the Combined Planning and Advisory Committee for the proposed New Commonwealth Governor's Academy described in detail in the accompanying application for this distinguished designation.

Jeff Schlegel 4/12/12

(Signature) (Date)

Advisory Committee Certification

The New Commonwealth Governor's Academy

Advisory Committee Member Agreement

Key to the success of the New Commonwealth Governor's Academy (Fairfax County Public Schools) is an actively engaged and knowledgeable Advisory Committee of representatives from industry, business, postsecondary and higher education and government.

As a member of the Advisory Committee, I will effectively:

1. Assist in the development of Academy programs; goals and objectives.
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4. Provide stewardship for the oversight of programs and course objectives to assure alignment with postsecondary/higher education and the regional workforce.
5. Provide ongoing evaluation of the programs, courses and co-curricular initiatives to assure achievement of the Academy's critical educational mission.
6. Serve as an Ambassador of the New Commonwealth Governor's Academy to the general community, business/industry and government.

Name: Zuzana Steen

Title: University & Academic Relations Manager

School/Institution/Organization: Micron Technology, Inc

My signature below certifies my willingness to be an active member on the Combined Planning and Advisory Committee for the proposed New Commonwealth Governor's Academy described in detail in the accompanying application for this distinguished designation.

(Signature) 2/10/12 (Date)

## Advisory Committee Certification

## The New Commonwealth Governor's Academy

### Advisory Committee Member Agreement

Key to the success of the New Commonwealth Governor's Academy (Fairfax County Public Schools) is an actively engaged and knowledgeable Advisory Committee of representatives from industry, business, postsecondary and higher education and government.

As a member of the Advisory Committee, I will effectively:

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5. Provide ongoing evaluation of the programs, courses and co-curricular initiatives to assure achievement of the Academy's critical educational mission.
6. Serve as an Ambassador of the New Commonwealth Governor's Academy to the general community, business/industry and government.

Name: Miljenko Tomovic

Title: Professor and Chair

School/Institution/Organization: Old Dominion University

My signature below certifies my willingness to be an active member on the Combined Planning and Advisory Committee for the proposed New Commonwealth Governor's Academy described in detail in the accompanying application for this distinguished designation.

(Signature) 2/10/2012 (Date)

Advisory Committee Certification

The New Commonwealth Governor's Academy

Advisory Committee Member Agreement

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3. Evaluate current classroom and laboratory facilities to assure achievement of learning objectives.
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5. Provide ongoing evaluation of the programs, courses and co-curricular initiatives to assure achievement of the Academy's critical educational mission.
6. Serve as an Ambassador of the New Commonwealth Governor's Academy to the general community, business/industry and government.

Name: Douglas Wright

Title: Administrator

School/Institution/Organization: Chantilly Academy, Fairfax County Public Schools

My signature below certifies my willingness to be an active member on the Combined Planning and Advisory Committee for the proposed New Commonwealth Governor's Academy described in detail in the accompanying application for this distinguished designation.

Douglas R. Wright
*(Signature)*

2/23/12
*(Date)*

# Appendix B:
# Memorandums
# of
# Agreement

MEMORANDUM OF AGREEMENT

BETWEEN PARTNERS

AND THE NEW COMMONWEALTH GOVERNOR'S STEM ACADEMY
AT CHANTILLY HIGH SCHOOL

PARTNERS AND THE **NEW COMMONWEALTH GOVERNOR'S STEM ACADEMY AT CHANTILLY HIGH SCHOOL** agree to enter into this Agreement to support the Academy's Career & Technical Education programs that will advance STEM careers. The Academy will provide enhanced opportunities in the areas of Engineering, Engineering Technology and Information Technology, preparing participants for the 21st century work place, advanced technical training or entrance into college or university studies. A major focus of the program will be to significantly increase the development and assessment of workplace readiness skills, "college – going" readiness, industry certifications and work-based learning opportunities that directly correlate to the workforce needs of the region.

**MOA TIMEFRAME:**

The MEMORADUM OF AGREEMENT period shall be June 1, 2012 through June 30, 2013 and will be extended annually unless modified or terminated by a partner.

**PARTNERS' AGREEMENTS:**

**The New Commonwealth Governor's STEM Academy agrees to:**

- Facilitate the mission and workings of the Academy Advisory Committee
- Provide and monitor comprehensive programs of studies in the Engineering Technology, Information Technology, , and Engineering concentrations
- Assure that curriculum is aligned with career pathways that meet the requirements for the Governor's Exemplary Standard Award Program, Workplace Readiness Skills for the Commonwealth of Virginia, and the Virginia Standard or Advanced Diplomas with CTE Seals
- Facilitate the administration of industry certifications exams
- Deliver counseling and other services that promote STEM education, career pathways, educational advancement and employment opportunities
- Provide documentation and information as requested by the Department of Education
- Provide the required equipment, software, and technical support to facilitate instruction

**Postsecondary Education Partners:** Northern Virginia Community College, Old Dominion University Engineering Technology Program, Norfolk State University College of Science, Engineering and Technology, and future partners agree to:

- Designate an individual who will serve as a contact person to serve as a liaison on the Advisory Committee
- Provide opportunities for Dual Enrollment courses, if articulation agreements exist, for students to earn transferable college credit

**Business Partners:** Current and future partners agree to:

- Designate an individual who will serve as a contact person to serve as a liaison on the Advisory Committee or in the capacity as a resource contact for the program departments
- Provide subject matter expert resources and opportunities for Academy students to receive real world experiences through project-based learning, field trips, guest speakers, job-shadowing, internships, and mentorships.
- Provide guidance and expertise to staff and/or students to promote STEM related teaching and learning

By signing this agreement both institutions agree to be active partners and agree to abide by this agreement.

The New Commonwealth Governor's STEM Academy PARTNER

Douglas Wright 4/9/12

Academy Administrator Date

*Virginia Manufacturers Association*

Name of Partner Organization

Alice Scott 4/10/12

Signature Date

Director of Marketing + Member Services

Title

MEMORANDUM OF AGREEMENT

BETWEEN PARTNERS

AND THE NEW COMMONWEALTH GOVERNOR'S STEM ACADEMY
AT CHANTILLY HIGH SCHOOL

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- Provide guidance and expertise to staff and/or students to promote STEM related teaching and learning

By signing this agreement both institutions agree to be active partners and agree to abide by this agreement.

**The New Commonwealth Governor's STEM Academy** **PARTNER**

Douglas Wright

Academy Administrator

4/9/12

Date

Northern Virginia Community College

Name of Partner Organization

Signature

4/9/12

Date

President

Title

MEMORANDUM OF AGREEMENT

BETWEEN PARTNERS

AND THE NEW COMMONWEALTH GOVERNOR'S STEM ACADEMY
AT CHANTILLY HIGH SCHOOL

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- Provide guidance and expertise to staff and/or students to promote STEM related teaching and learning

By signing this agreement both institutions agree to be active partners and agree to abide by this agreement.

**The New Commonwealth Governor's STEM Academy** **PARTNER**

Douglas Wright

Academy Administrator

4/9/12

Date

*The SI Organization, Inc.*

Name of Partner Organization

Signature

4/9/2012

Date

**Douglas S. Huneycutt, Sr.**
**Senior Cybersecurity Technologist**

Title

MEMORANDUM OF AGREEMENT

BETWEEN PARTNERS

AND THE NEW COMMONWEALTH GOVERNOR'S STEM ACADEMY
AT CHANTILLY HIGH SCHOOL

PARTNERS AND THE **NEW COMMONWEALTH GOVERNOR'S STEM ACADEMY AT CHANTILLY HIGH SCHOOL** agree to enter into this Agreement to support the Academy's Career & Technical Education programs that will advance STEM careers. The Academy will provide enhanced opportunities in the areas of Engineering, Engineering Technology and Information Technology, preparing participants for the 21st century work place, advanced technical training or entrance into college or university studies. A major focus of the program will be to significantly increase the development and assessment of workplace readiness skills, "college – going" readiness, industry certifications and work-based learning opportunities that directly correlate to the workforce needs of the region.

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- Provide guidance and expertise to staff and/or students to promote STEM related teaching and learning

By signing this agreement both institutions agree to be active partners and agree to abide by this agreement.

The New Commonwealth Governor's STEM Academy PARTNER

Douglas Wright 4/9/12

Academy Administrator Date

*SRC Inc.*

Name of Partner Organization

by: Melissa A. Boose 4/9/2012

Signature Date

Corporate Contract Manager

Title

**MEMORANDUM OF AGREEMENT**

**BETWEEN PARTNERS**

**AND THE NEW COMMONWEALTH GOVERNOR'S STEM ACADEMY AT CHANTILLY HIGH SCHOOL**

PARTNERS AND THE **NEW COMMONWEALTH GOVERNOR'S STEM ACADEMY AT CHANTILLY HIGH SCHOOL** agree to enter into this Agreement to support the Academy's Career & Technical Education programs that will advance STEM careers. The Academy will provide enhanced opportunities in the areas of Engineering, Engineering Technology and Information Technology, preparing participants for the 21st century work place, advanced technical training or entrance into college or university studies. A major focus of the program will be to significantly increase the development and assessment of workplace readiness skills, "college – going" readiness, industry certifications and work-based learning opportunities that directly correlate to the workforce needs of the region.

**MOA TIMEFRAME:**

The MEMORADUM OF AGREEMENT period shall be June 1, 2012 through June 30, 2013 and will be extended annually unless modified or terminated by a partner.

**PARTNERS' AGREEMENTS:**

**The New Commonwealth Governor's STEM Academy agrees to:**

- Facilitate the mission and workings of the Academy Advisory Committee
- Provide and monitor comprehensive programs of studies in the Engineering Technology, Information Technology, , and Engineering concentrations
- Assure that curriculum is aligned with career pathways that meet the requirements for the Governor's Exemplary Standard Award Program, Workplace Readiness Skills for the Commonwealth of Virginia, and the Virginia Standard or Advanced Diplomas with CTE Seals
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- Provide guidance and expertise to staff and/or students to promote STEM related teaching and learning

By signing this agreement both institutions agree to be active partners and agree to abide by this agreement.

**The New Commonwealth Governor's STEM Academy** **PARTNER**

Douglas Wright 4/9/12

Academy Administrator Date

***Orbital Sciences Corporation***

Name of Partner Organization

Signature __9 April 2012_____

Date

____Sr. Principal Engineer_____

Title

**MEMORANDUM OF AGREEMENT**

**BETWEEN PARTNERS**

**AND THE NEW COMMONWEALTH GOVERNOR'S STEM ACADEMY AT CHANTILLY HIGH SCHOOL**

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**PARTNERS' AGREEMENTS:**

**The New Commonwealth Governor's STEM Academy agrees to:**

- Facilitate the mission and workings of the Academy Advisory Committee
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By signing this agreement both institutions agree to be active partners and agree to abide by this agreement.

**The New Commonwealth Governor's STEM Academy** **PARTNER**

Douglas Wright
Academy Administrator

4/9/12
Date

***Micron Technology***

Name of Partner Organization

Signature

4/9/2012
Date

University and Academic Relations Manager
Title

**MEMORANDUM OF AGREEMENT**

**BETWEEN PARTNERS**

**AND THE NEW COMMONWEALTH GOVERNOR'S STEM ACADEMY AT CHANTILLY HIGH SCHOOL**

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**The New Commonwealth Governor's STEM Academy** **PARTNER**

Douglas Wright
Academy Administrator

4/9/12
Date

***Northrop Grumman Information Systems***

Name of Partner Organization

Lynn Fulmore
Signature

4/9/12
Date

Director, Corporate Citizenship
Title

**MEMORANDUM OF AGREEMENT**

**BETWEEN PARTNERS**

**AND THE NEW COMMONWEALTH GOVERNOR'S STEM ACADEMY AT CHANTILLY HIGH SCHOOL**

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- Facilitate the mission and workings of the Academy Advisory Committee
- Provide and monitor comprehensive programs of studies in the Engineering Technology, Information Technology, , and Engineering concentrations
- Assure that curriculum is aligned with career pathways that meet the requirements for the Governor's Exemplary Standard Award Program, Workplace Readiness Skills for the Commonwealth of Virginia, and the Virginia Standard or Advanced Diplomas with CTE Seals
- Facilitate the administration of industry certifications exams
- Deliver counseling and other services that promote STEM education, career pathways, educational advancement and employment opportunities
- Provide documentation and information as requested by the Department of Education
- Provide the required equipment, software, and technical support to facilitate instruction

**Postsecondary Education Partners:** Northern Virginia Community College, Old Dominion University Engineering Technology Program, Norfolk State University College of Science, Engineering and Technology, and future partners agree to:

- Designate an individual who will serve as a contact person to serve as a liaison on the Advisory Committee
- Provide opportunities for Dual Enrollment courses, if articulation agreements exist, for students to earn transferable college credit

**Business Partners:** Current and future partners agree to:

- Designate an individual who will serve as a contact person to serve as a liaison on the Advisory Committee or in the capacity as a resource contact for the program departments
- Provide subject matter expert resources and opportunities for Academy students to receive real world experiences through project-based learning, field trips, guest speakers, job-shadowing, internships, and mentorships.
- Provide guidance and expertise to staff and/or students to promote STEM related teaching and learning

By signing this agreement both institutions agree to be active partners and agree to abide by this agreement.

**The New Commonwealth Governor's STEM Academy** **PARTNER**

Douglas Wright
Academy Administrator

4/9/12
Date

***Dulles Regional Chamber of Commerce***

Name of Partner Organization

Eileen Curtis
Signature

4/9/12
Date

President
Title

MEMORANDUM OF AGREEMENT

BETWEEN PARTNERS

AND THE NEW COMMONWEALTH GOVERNOR'S STEM ACADEMY
AT CHANTILLY HIGH SCHOOL

PARTNERS AND THE **NEW COMMONWEALTH GOVERNOR'S STEM ACADEMY AT CHANTILLY HIGH SCHOOL** agree to enter into this Agreement to support the Academy's Career & Technical Education programs that will advance STEM careers. The Academy will provide enhanced opportunities in the areas of Engineering, Engineering Technology and Information Technology, preparing participants for the 21st century work place, advanced technical training or entrance into college or university studies. A major focus of the program will be to significantly increase the development and assessment of workplace readiness skills, "college – going" readiness, industry certifications and work-based learning opportunities that directly correlate to the workforce needs of the region.

**MOA TIMEFRAME:**

The MEMORADUM OF AGREEMENT period shall be June 1, 2012 through June 30, 2013 and will be extended annually unless modified or terminated by a partner.

**PARTNERS' AGREEMENTS:**

**The New Commonwealth Governor's STEM Academy agrees to:**

- Facilitate the mission and workings of the Academy Advisory Committee
- Provide and monitor comprehensive programs of studies in the Engineering Technology, Information Technology, , and Engineering concentrations
- Assure that curriculum is aligned with career pathways that meet the requirements for the Governor's Exemplary Standard Award Program, Workplace Readiness Skills for the Commonwealth of Virginia, and the Virginia Standard or Advanced Diplomas with CTE Seals
- Facilitate the administration of industry certifications exams
- Deliver counseling and other services that promote STEM education, career pathways, educational advancement and employment opportunities
- Provide documentation and information as requested by the Department of Education
- Provide the required equipment, software, and technical support to facilitate instruction

**Postsecondary Education Partners:** Northern Virginia Community College, Old Dominion University Engineering Technology Program, Norfolk State University College of Science, Engineering and Technology, and future partners agree to:

- Designate an individual who will serve as a contact person to serve as a liaison on the Advisory Committee
- Provide opportunities for Dual Enrollment courses, if articulation agreements exist, for students to earn transferable college credit

**Business Partners:** Current and future partners agree to:

- Designate an individual who will serve as a contact person to serve as a liaison on the Advisory Committee or in the capacity as a resource contact for the program departments
- Provide subject matter expert resources and opportunities for Academy students to receive real world experiences through project-based learning, field trips, guest speakers, job-shadowing, internships, and mentorships.
- Provide guidance and expertise to staff and/or students to promote STEM related teaching and learning

By signing this agreement both institutions agree to be active partners and agree to abide by this agreement.

**The New Commonwealth Governor's STEM Academy** **PARTNER**

Douglas Wright

Academy Administrator

4/9/12

Date

*Lockheed Martin Corporation*

Name of Partner Organization

Signature

4/9/2012

Date

**MS2 Operations Site Lead – Manassas, VA**

Title

# Appendix C:

# Letter of Assurance

# From Fiscal Agent

## Governor's Science, Technology, Engineering and Mathematics (STEM) Academy

## STATEMENT OF ASSURANCES

The authorized signature on this page certifies to the Virginia Department of Education that the authorized official assures that:

1. The Advisory Committee has reviewed the provisions of *Administrative Procedures Guide for the Establishment of Governor's STEM Academies* outlined in the Guidance Manual, and understands that an implementation proposal will need to address these criteria and/or others approved by the Virginia Board of Education.

2. The Advisory Committee agrees to follow the guidelines set forth in the *Administrative Procedures* Guide for the Establishment of Governor's STEM Academy's document.

3. If the Governor's STEM Academy will be a jointly operated program, an ongoing governing board will be established or maintained to reflect current Board of Education regulations relative to jointly operated schools and programs.

4. A public, government entity will serve as the grant fiscal agent.

**Certification by Authorized or Institutional Official:**

The applicant certifies that to the best of his/her knowledge the information in this application is correct, that the filing of this application is duly authorized by the partners participating in this process to establish a Governor's STEM Academy, and that the applicant will comply with the statements of assurances.

Jack D. Dale
Typed or Printed Name of Authorized Official

Superintendent of Schools
Title

Signature of Authorized Official

February 24, 2012
Date

# Appendix D:

# Budget

# NEW COMMONWEALTH GOVERNOR'S STEM ACADEMY

## BUDGET

| A – Direct Costs | TOTAL | | | |
|---|---|---|---|---|
| | State Funds | Perkins Funds | Other Funds (Local or grant funds to be described in Budget Narrative) | In-Kind |
| 1. Personnel --- 1000 | | | | $36,007.48 |
| 2. Employment Benefits --- 2000 | | | | $15,771.28 |
| 3. Purchased/Contractual Services ---- 3000 | | | | |
| 4. Internal Services ---- 4000 | | | | |
| 5. Staff Development ---- 5000 | | | $3,000.00 | |
| 6. Summer Component Activities ---- 5000 | | | | |
| 7. Travel ---- 5000 | | | | |
| 8. Contractual Services ---- 5000 | | | | |
| 9. Materials and Supplies ---- 6000 | | $18,000.00 | $6,000.00 | $10,000.00 |
| 10. Equipment ---- 8000 | | | | |
| 11. Facilities ---- 8000 | | | | |
| **B – Indirect Costs *** | | | | |
| **TOTAL** | | $18,000.00 | $9,000.00 | $61,778.76 |

* If recovering indirect costs, the rate must not exceed the federally approved indirect cost rate of the fiscal agent.

# Appendix E:
# Pathway Programs of Study

## Engineering and Technology
## Network Systems - Cybersecurity

# Northern Virginia Plan of Study

**NOVA Division:**
**Fairfax County Public Schools**
**School:**
**New Commonwealth Governor's STEM Academy**

**Cluster:** ***Science, Technology, Engineering & Mathematics*** **Pathways:** ***Engineering and Technology***

*This Career Pathway Plan of Study can serve as a guide as learners continue on a career path. Courses listed within this plan are only recommended and should be individualized to meet each learner's educational and career goals.*

| EDUCATION LEVELS | GRADE | English/ Language Arts | Mathematics | Science | Social Studies/ Science | Other Required Courses Recommended Electives Learner Activities | Recommended Career and Technical Courses | SAMPLE – Occupations Relating to This Pathway: |
|---|---|---|---|---|---|---|---|---|
| **Graduation Requirements: http://www.doe.virginia.gov/2plus4in2004/index.shtml** | | | | | | | | **Occupations:**<br><br>**Aeronautical Engineering Technician**<br><br>**Air Conditioning Engineering Technician**<br><br>**Architectural Engineering Technician**<br><br>**Automotive Engineering Technician**<br><br>**Bioengineering and Biomedical Engineering Technician**<br><br>**Civil Engineering Technician**<br><br>**Computer Engineering Technician**<br><br>**Construction Engineering Technician**<br><br>**Electrical Engineering** |
| MIDDLE | 7 | 1110 English 7<br>111036 English 7 Honors | 3112 Math 7<br>311136 Math 7 Honors<br>3130 Algebra I<br>3135 Algebra II<br>313036 Algebra I Honors | 4115 Life Science<br>411536 Life Science Honors | 2355<br>US History 1865 – Present<br>235536 US History 7 Honors | 7120 Phys Ed | 6150 Keyboarding<br>6160 Digital Input Technologies<br>6609 Computer Solutions<br>8461 Inventions & Innovations<br>9072 Career Applications Phase III | |
| MIDDLE | 8 | 1120 English 8<br>112036 English 8 Honors | 3112 Math 8<br>3130 Algebra I<br>3135 Algebra II<br>3143 Geometry<br>314336 Geometry Honors<br>313036 Algebra I Honors | 4125 Physical Science<br>412536 Physical Science Honors | 2357 Civics & Economics<br>235736 Civics & Economics Honors | 7200 Phys Ed | 6150 Keyboarding<br>6160 Digital Input Technologies<br>6609 Computer Solutions<br>8462 Technological Systems<br>9072 Career Applications Phase III | |
| **Career Assessment:** Virginia Wizard.. | | | | | | | | |
| SECONDARY | 9 | 1130 English 9<br>113039 World Civilization I<br>113036 English 9 Honors | 3130 Algebra I<br>313036 Algebra I Honors<br>3135 Algebra II<br>313536 Algebra II Honors<br>3143 Geometry<br>314336 Geometry Honors<br>3184 Computer Science | 4310 Biology I<br>431036 Biology I Honors | 2219 World History I<br>221936 World History 1 Honors<br><br>237539 World Civilization I | 7300 PE Health I<br><br>7405 PE Health II<br><br>Foreign Language (3 years)<br><br>6120 Economics & Personal Finance | 8435 Technical Drawing & Design | |
| SECONDARY | 10 | 1140 English 10<br>114036 English 10 Honors | 3143 Geometry<br>314336 Geometry Honors<br>3135 Algebra II<br>313536 Algebra II Honors<br>3184 Computer Science<br>318505 AP Computer Science<br>3160 Precal with Trig<br>316036 Precal with Trig Honors<br>3130 Algebra I<br>313036 Algebra I Honors<br>3160DE PreCal DE | 4410 Chemistry<br>441036 Chemistry Honors<br>451050 Active Physics | 2221 World History II<br>222136 World History II Honors<br><br>234004 AP World History<br>239904 AP Euro Studies | | 8435 Technical Drawing & Design<br><br>8447 Production Systems I | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **11** | 1150 English 11<br>119605 AP English<br>115097 English 11 Honors | 3135 Algebra II<br>313536 Algebra II Honors<br>3184 Computer Science<br>318505 AP Computer Science<br>3160 PreCal/Trig<br>316036 PreCal/Trig Honors<br>3160DE PreCalculus DE<br>3154 Discrete Math<br>319062 Probability Statistics<br>319204 AP Statistics<br>317004 AP Calc AB<br>317704 AP Calc BC<br>317860 MultiVar Calculus<br>319800 Matrix Algebra | 4310 Biology<br>431036 Biology Honors<br>4410 Chemistry<br>441036 Chemistry Honors<br>4510 Physics<br>451036 Physics Honors<br>4220 Geosystems<br>422036 Geosystems Honors<br>457005 AP Physics-B<br>457004 AP Physics-C<br>451050 Act Physics<br>437004 AP Biology<br>447004 AP Chemistry<br>4330 Human Anatomy<br>4260 Astronomy<br>427004 AP Environmental Science<br>452026 Eng Phy<br>435000 Genetics & BioTech<br>425000 Oceanography | 2360 US History<br>231904 AP US History<br>234004 AP World History<br>239904 AP Euro History | 8436 Engineering Drawing & Design<br>**DE** EGR 115 Engineering Graphics (2 credits) | 8490 Engineering Studies<br><br>8436 Engineering Drawing & Design<br>**DE** EGR 115 Engineering Graphics (2 credits)<br><br>8447 Production Systems I<br><br>8425 Manufacturing System I | **Technician**<br><br>**Electromechanical Engineering Technician**<br><br>**Environmental Engineering Technician**<br><br>**Industrial Engineering Technician**<br><br>**Manufacturing Engineering Technician**<br><br>**Marine Engineering Technician**<br><br>**Mechanical Engineering Technician**<br><br>**Nuclear and Radiological Engineering Technician**<br><br>**Surveying and Geomatics Engineering Technician**<br><br>**Telecommunications Engineering Technician**<br><br>**<u>Certificate or 2-Year Degree</u>**<br>►<br>**AAS Engineering Technology**<br>**AS Engineering Technology**<br><br>**<u>Bachelor of Science Degree</u>**<br>**Engineering Technology** |
| **12** | 1160 English 12<br>1160DE English 12 **DE**<br><br>119504 AP English Literature Composition | 3135 Algebra II<br>313536 Algebra II Honors<br>3184 Computer Science<br>318505 AP Computer Science<br>3160 PreCal/Trig<br>316036 PreCal/Trig Honors<br>3160DE PreCalculus DE<br>3154 Discrete Math<br>319062 Probability Statistics<br>319204 AP Statistics<br>317004 AP Calc AB<br>317704 AP Calc BC<br>317860 MultiVar Calculus<br>319800 Matrix Algebra | 4310 Biology<br>431036 Biology Honors<br>4410 Chemistry<br>441036 Chemistry Honors<br>4510 Physics<br>451036 Physics Honors<br>4220 Geosystems<br>422036 Geosystems Honors<br>457005 AP Physics-B<br>457004 AP Physics-C<br>451050 Act Physics<br>437004 AP Biology<br>447004 AP Chemistry<br>4330 Human Anatomy<br>4260 Astronomy<br>427004 AP Environmental Science<br>452026 Eng Phy<br>435000 Genetics & BioTech<br>425000 Oceanography | 2440 US Government<br>244504 AP US Government<br>244567 AP Combined US & Comp Government<br>234004 AP World History<br>239904 AP Euro History | 8416 Electronic Systems I<br>**DE ETR 113 DC & AC Fundamentals I**<br><br>8412 Electronic Systems 2<br>**DE** ETR 106 Basic Programming/ Electronic Calculations | 8491 Advanced Engineering<br><br>ETR 113 DC & AC Fundamentals I (4 credits)<br><br>ETR 106 ETR 106 Basic Programming Applied to Electrical/Electronic Calculations<br><br>8427 Advanced Manufacturing Systems II | |

| Dual Enrolled Courses: College courses in the pathway offered locally for high school and/or college credit | |
|---|---|
| **Related certifications/credentials approved by VDOE and offered locally:**<br>Virginia Career Readiness Certification (CRC) and IC$^3$ Certification (Certiport); Pre-Engineering Assessment (NOCTI); AutoCAD Certifications (Brainbench); Autodesk Application Certification Program (Autodesk); Brainbench Web Design and Development Certifications (Brainbench); Certified SolidWorks Professional (SolidWorks Corporation); Pre-Skills Assessment for Mastercam Certification (NOCTI); CAD Assessment (NOCTI) | **Additional Learning Opportunities:**<br>Student Organization(s): Technology Student Association of America (TSA), FIRST Robotics – Chantilly Robotics 612, and IEEE Student Club of Chantilly Academy.<br><br>**Work-Based Learning:**<br>X Career Research X Cooperative Education X Internship X Mentorship<br>X Job Shadowing X Student Apprenticeship |
| **Postsecondary**: Placement assessments such as COMPASS & SAT II | College Entrance Exams such as ACT & SAT |

| POSTSECONDARY | | | | |
|---|---|---|---|---|
| | **Pathway: Engineering and Technology** | **AAS Engineering Technology**<br>**AS Engineering Technology** | **BS Engineering Technology** | |

## College: Northern Virginia Community College

POSTSECONDARY - COMMUNITY COLLEGE or APPRENTICESHIP - Determined Locally

| Semester | English | Mathematics | Science | Social Studies | Required Courses or Recommended Electives | | | |
|---|---|---|---|---|---|---|---|---|
| Year 1 1st Semester | If needed ENG 111 College Comp I (3 cr) | MTH 166 Precalculus with Trigonometry (5cr) OR If needed MTH 163 / 164 Precalculus I & II | | Social Science Elective (3 cr) | ARC 121 Architectural Drafting I (3cr) | CIV 171 Surveying I (3cr) | If needed ETR 106 Basic Programming Applied to Electrical/Electronic Calculations OR CSC 110 Introduction to Computing (2-3cr) | SDV Elective (1 cr) |
| Year 1 2nd Semester | | | | | ARC 133 Construction Methodology & Procedures I (3cr) | DRF 201 Computer Aided Drafting & Design I (4cr) | MEC 112 Processes of Industry (3cr) | PED 116 Lifetime Fitness and Wellness (1-2cr) *If taken for 1cr, must take one additional PED course |
| Year 2 1st Semester | SPD Elective (3cr) | | | HIS 101 History of Western Civilization I (3cr) | CIV 210 Structural Systems (5cr) | If needed EGR 115 Engineering Graphics (2cr) | EGR 130 Statics and Strength of Materials (5cr) | If needed ELECTIVE ETR 113 DC & AC Fundamentals I |
| Year 2 2nd Semester | | | PHY 201 General College Physics I (4cr) | | ARC 122 Architectural Drafting II (3cr) | DRF 140 Technical Drawing (3cr) | If needed DRF 202 Computer Aided Drafting & Design II (3cr) | MEC 118 Automated Manufacturing Technology (3cr) |

| | |
|---|---|
| **Related Industry Certifications Available:**<br>ESEP Expert Systems Engineering Professional, CSEP-Asq CSEP w/US DoD Acquisition, CSEP Certified Systems Engineer Professional, ASEP Associate Systems Engineering Professional, Manufacturing Technician Levels 1-4 (Virginia Manufacturers Association) | **Additional Suggested Learning Opportunities:**<br>**Work-Based Learning:**<br>X Registered Apprenticeship X Cooperative Education X Internship<br>X Mentorship |

UNIVERSITY

University/College: Old Dominion University, Norfolk State University, Purdue University, Penn State University, Rochester Institute of Technology, Alfred State College, University of Cincinnati, University of Dayton, Brigham Young University, Cal State – Long Beach, Ball State University, Arizona State University, Texas A&M.
Degree or Major: Bachelor of Science Engineering Technology
Number of Articulated CC Credits: **Accept all AAS coursework and enter as junior**

# Northern Virginia Plan of Study

**NOVA Division:**
**Fairfax County Public Schools**
**School:**
**New Commonwealth Governor's STEM Academy at Chantilly High School**

## Cluster: ***Information Technology*** Pathway: ***Network Systems - CyberSecurity***

*This Career Pathway Plan of Study can serve as a guide as learners continue on a career path. Courses listed within this plan are only recommended and should be individualized to meet each learner's educational and career goals.*

| EDUCATION LEVELS | GRADE | English/ Language Arts | Mathematics | Science | Social Studies/ Science | Other Required Courses Recommended Electives Learner Activities | Recommended Career and Technical Courses | SAMPLE – Occupations Relating to This Pathway: |
|---|---|---|---|---|---|---|---|---|
| **Graduation Requirements: http://www.doe.virginia.gov/2plus4in2004/index.shtml** | | | | | | | | **Possible Occupations**<br>➢ Network Engineer<br>➢ CyberSecurity Specialist<br><br>**Certificate or 2-Year Degree**<br>➢<br>➢ AAS Information Systems Technology<br>➢ BS Information Technology - CyberSecurity |
| MIDDLE | 7 | 1110 English 7<br>111036 English 7 Honors | 3112 Math 7<br>311136 Math 7 Honors<br>3130 Algebra I<br>3135 Algebra II<br>313036 Algebra I Honors | 4115 Life Science<br>411536 Life Science Honors | 2354<br>US History 1865 – Present<br>235536 US History 7 Honors | 7120 Phys Ed | 6150 Keyboarding<br>6160 Digital Input Technologies<br>6609 Computer Solutions<br>8461 Inventions & Innovations<br>9072 Career Applications Phase III | |
| MIDDLE | 8 | 1120 English 8<br>112036 English 8 Honors | 3112 Math 8<br>3130 Algebra I<br>3135 Algebra II<br>3143 Geometry<br>34336 Geometry Honors<br>313036 Algebra I Honors | 4125 Physical Science<br>412536 Physical Science Honors | 2357 Civics & Economics<br>235736 Civics & Economics Honors | 7200 Phys Ed | 6150 Keyboarding<br>6160 Digital Input Technologies<br>6609 Computer Solutions<br>8462 Technological Systems<br>9072 Career Applications Phase III | |
| **Career Assessment:** Virginia Wizard | | | | | | | | |
| SECONDARY | 9 | 1130 English 9<br>2375 World Civilization I<br>11303 English 9 Honors | 3130 Algebra I<br>313036 Algebra I Honors<br>3135 Algebra II<br>313536 Algebra II Honors<br>3143 Geometry<br>31433 Geometry Honors<br>3184 Computer Science | 4310 Biology I<br>43103 Biology I Honors | 2219 World History I<br>221936 World History 1 Honors<br><br>237539 World Civilization I | 7300 PE Health I<br>7405 PE Health II<br><br>Foreign Language (3 years)<br><br>Other Electives to Complement Pathway (Core Academic and CTE):<br><br>6120 Economics & Personal Finance | | |
| SECONDARY | 10 | 1140 English 10<br>11403 English 10 Honors<br><br>2375 World Civilization II | 3143 Geometry<br>314336 Geometry Honors<br>3135 Algebra II<br>313536 Algebra II Honors<br>3184 Computer Science<br>318505 AP Computer | 4410 Chemistry<br>441036 Chemistry Honors<br>451050 Active Physics | 2221 World History II<br>222136 World History II Honors<br>234004 AP World History<br>239904 AP Euro Studies | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | Science<br>3160 Precal with Trig<br>316036 Precal with Trig Honors<br>3130 Algebra I<br>313036 Algebra I Honors<br>3160DE PreCal DE | | | 6612 Computer Information Systems<br>**DE** ITE 115 Intro to Computer Applications & Concepts | | |
| **11** | 1150 English 11<br>1196 AP English<br>115097 English 11 Honors | 3135 Algebra II<br>313536 Algebra II Honors<br>3184 Computer Science<br>318505 AP Computer Science<br>3160 PreCal/Trig<br>316036 PreCal/Trig Honors<br>3160DE PreCalculus DE<br>3154 Discrete Math<br>319062 Probability Statistics<br>319204 AP Statistics<br>317004 AP Calc AB<br>317704 AP Calc BC<br>317860 MultiVar Calculus<br>319800 Matrix Algebra | 4310 Biology<br>431036 Biology Honors<br>4410 Chemistry<br>441036 Chemistry Honors<br>4510 Physics<br>451036 Physics Honors<br>4220 Geosystems<br>422036 Geosystems Honors<br>457005 AP Physics-B<br>457004 AP Physics-C<br>451050 Act Physics<br>437004 AP Biology<br>447004 AP Chemistry<br>4330 Human Anatomy<br>4260 Astronomy<br>427004 AP Environmental Science<br>452026 Eng Phy<br>435000 Genetics & BioTech<br>425000 Oceanography | 2360 US History<br>231904 AP US History<br>234004 AP World History<br>239904 AP Euro History | 8543 Computer Networking Hardware Operations II<br>**DE** ITN 154 Cisco 1 & ITN 155 Cisco 2<br><br>8544 Computer Networking Hardware Operations III<br>**DE** ITN 156 CISCO 3 & ITN 157 Cisco 4<br><br>6650 Computer Network Software Operations<br>**DE** ITN 120 Wireless Network Administration<br><br>6651 Computer Network Software Operations. Advanced<br>**DE** ITN 260 Network Security Basics | ITE 115 Intro to Computer Applications & Concepts<br><br>ITN 100 Introduction to Telecommunications (3cr)<br><br>ITN 154 & 155 CISCO 1 & 2 (4 cr each)<br><br>ITN 156 CISCO 3 & ITN 157 CISCO 4 (4 cr each) | |
| **12** | 1160 English 12<br>1160DE English 12 **DE**<br><br>119504 AP English Literature Composition | 3135 Algebra II<br>313536 Algebra II Honors<br>3184 Computer Science<br>318505 AP Computer Science<br>3160 PreCal/Trig<br>316036 PreCal/Trig Honors<br>3160DE PreCalculus DE<br>3154 Discrete Math<br>319062 Probability Statistics<br>319204 AP Statistics<br>317004 AP Calc AB<br>317704 AP Calc BC<br>317860 MultiVar Calculus<br>319800 Matrix Algebra | 4310 Biology<br>431036 Biology Honors<br>4410 Chemistry<br>441036 Chemistry Honors<br>4510 Physics<br>451036 Physics Honors<br>4220 Geosystems<br>422036 Geosystems Honors<br>457005 AP Physics-B<br>457004 AP Physics-C<br>451050 Act Physics<br>437004 AP Biology<br>447004 AP Chemistry<br>4330 Human Anatomy<br>4260 Astronomy<br>427004 AP Environmental Science<br>452026 Eng Phy | 2440 US Government<br>244504 AP US Government<br>244567 AP Combined US & Comp Government<br>234004 AP World History<br>239904 AP Euro History | | ITN 120 Wireless Network Administration (3 cr)<br><br>ITN 260 Network Security Basics (3 cr) | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | 435000 Genetics & BioTech<br>425000 Oceanography | | | | |

**Dual Enrolled Courses: College courses in the pathway offered locally for high school and/or college credit**

**Related certifications/credentials approved by VDOE and offered locally:**
Virginia Workplace Readiness, Virginia Career Readiness Certification (CRC) and IC$^3$ Certification (Certiport); Microsoft Office Specialist (MOS) (Microsoft); Oracle Certification Program Examinations (Oracle); Brainbench Software Development Certifications (Brainbench); Brainbench Web Administration Certifications (Brainbench); Java Programming Examination (Cisco Systems); Adobe Certified Associate (Adobe Systems, Inc.); Apple Pro Certification Program (Apple, Inc.); A+ Certifications (2006 Objectives) (CompTIA); Brainbench Systems Administration Certifications (Brainbench); Brainbench Technical Support Certifications (Brainbench); Certified Computer Service Technician (CST) (Electronics Technicians Association, International—ETA)

**Additional Learning Opportunities:**
Student Organization(s): **AFA CyberPatriot, IEEE Student Club, CyberSecurity Summer Camp.**

**Work-Based Learning:**
X Career Research X Cooperative Education X Internship X Mentorship
X Job Shadowing X Student Apprenticeship

**Postsecondary**: Placement assessments such as COMPASS & SAT II

College Entrance Exams such as ACT & SAT

**POSTSECONDARY**

**SAMPLE POSTSECONDARY PROGRAMS RELATED TO THIS CAREER PATHWAY**

| | | | |
|---|---|---|---|
| **Pathway: Network Systems, Information Support & Services, Interactive Media, Programming & Software Development** | **AAS Information Systems Technology** | **BS Information Technology OR Computer Science** | **MS Information Technology OR Computer Science** |

## College: Northern Virginia Community College

POSTSECONDARY - COMMUNITY COLLEGE or APPRENTICESHIP - Determined Locally

| Semester | English | Mathematics | Science | Social Studies | Required Courses or Recommended Electives | | | |
|---|---|---|---|---|---|---|---|---|
| Year 1 1st Semester | If needed ENG 111 College Comp I (3 cr) | MTH 151 Math for the Liberal Arts I OR If needed higher level math course (3cr) | | Social Science Elective (3 cr) | ITE 105 IT Careers & Cyber Ethics (2cr) | If needed ITE 115 Intro to Computer Applications & Concepts (3cr) | ITP 100 Software Design (3cr) | **If needed** SDV Elective (1 cr) |
| Year 1 2nd Semester | | | | Social Science Elective ( 3 cr) | **If needed** ITN 100 Introduction to Telecommunications (3cr) ITE115 prereq. | ITD 256 Advanced Database Management (3cr) | ITE 221 PC Hardware and OS Architecture (3cr) | ITN 171 Unix I (3cr) |
| Year 2 1st Semester | SPD Elective (3cr) | | | Humanities/Fine Arts Elective (3cr) | ITP 170 Project Management (3cr) | If needed IT Electives (9cr)<br><br>ITN 120 and 260 | | |
| Year 2 2nd Semester | | | | | If needed IT Electives (12-16cr) CISCO courses | | | PED 116 Lifetime Fitness and Wellness (1-2cr) *If taken for 1cr, must take one additional PED course |

| **Related Industry Certifications Available:** | **Additional Suggested Learning Opportunities:** |
|---|---|
| A+ Computer Hardware Certification, CCNA Cisco Certified Network Academy, CCNP Cisco Certified Network Professional, CCENT Cisco Certified Entry Networking Technician, Certified Fiber Optic Technician, Comp TIA A+, MCP Microsoft Certified Professional, MCP Microsoft Certified Professional + Intenet, MCSE Microsoft Certified Systems Engineer, MOS Microsoft Office Specialist, Network Cabling Specialist, Network+, Oracle Database Administration, Prometric APTC (Authorized Prometric Testing Center), Security+ | **Work-Based Learning:**<br>X Registered Apprenticeship X Cooperative Education X Internship<br>X Mentorship |

| UNIVERSITY | |
|---|---|
| | University/College: George Mason, Virginia Tech<br>Degree or Major: BS Information Technology<br>Number of Articulated CC Credits: Courses accepted on a case-by-case basis. General Ed courses are not waived and students will enter as lower classman. |

# Appendix F:

# 2012–2013

# Chantilly Academy Bell Schedule

**2012-2013 Chantilly Academy Schedule**

| Period 1 | Period 2 | Period 3 | Period 4 | Period 5 | Period 6 | Period 7 | Period 8 |
|---|---|---|---|---|---|---|---|
| Computer Systems Technology | | Computer Systems Technology - Girls Section | | Planning | IPR | Computer Systems Technology | |
| Auto Tech 1 Feeder | Auto Tech 2 | Auto Tech 1 Feeder | Auto Tech 2 | Planning | IPR | Chantilly all Auto Tech 1 | |
| Auto Collision Feeder | Auto Collision 2 | Auto Collision Feeder | Auto Collision 2 | Planning | IPR | Chantilly all Auto Collision 1 | |
| Cosmetology 1 | | Cosmetology 1 | | Planning | IPR | Cosmetology 2 | |
| Cosmetolgy 1 feeder | Cosmetology 2 | Cosmetology 1 feeder | Cosmetology 2 | CHS Cos 1 | IPR | CHS Cosmetology 1 | Planning |
| Culinary Arts 1 | | Culinary Arts 1 | | Planning | IPR | Culinary Arts 2 | |
| ECC 2 | ECC 1 | ECC 2 | ECC 1 | Planning | IPR | | |
| Entrepreneurship 1 | Entrepreneurship 1 | | Entrepreneurship 2 | Planning | Entrepreneurs | IPR | Entrepreneurship 1 |
| Dental 1 feeder | Dental Careers 1 | Dental 1 feeder | Dental Careers 1 | Planning | IPR | Dental Careers 2 | |
| | | | GIS | Planning | IPR | | |
| Criminal Justice 2 | | Crim. Justice 1 feeder | Crim. Justice 1 | Planning | IPR | Crim. Justice 1 | Crim. Justice 1 |
| Animal Science 1 and 2 | | Animal Science 1 and 2 | | Planning | IPR | Chantilly all Animal Science 1 and 2 | |
| AFJROTC Foundations | | AFJROTC Foundations | | Planning | IPR | AFJROTC Advanced | |
| Pharmacy Technician | | Pharmacy Technician | | Planning | IPR | Chantilly all Pharmacy Tech 1 and 2 | |
| | | Oracle (online course) | | Planning | IPR | Cisco | Cisco |
| Medical Assistant | | Exploring Health Science Feeder | | Planning | IPR | Chantilly all Exploring Health Science | |
| | | | Engineering Math | Planning | | | |
| Eng. Physics 2 | Girls in Eng. | Eng. Physics 2 feeder | Eng. Systems 1 | Planning | IPR | Eng. Systems 2 | CHS all Eng. Sys 1 |
| Carpentry 1 | Carpentry 2 | Carpentry 1 | Carpentry 2 | Planning | IPR | Chantilly all Carpentry 1 | |
| Networking | | Networking | | | | | |
| | KEY | | | | | | |
| | white - all Chantilly students | | Periods 1 & 2 meet from bus arrival (approx 7:40) - 8:45 a.m. block | | | | |
| | blue - open to CHS and feeder students | | Periods 3 & 4 meet from bus arrival (approx. 9:30) - 10:50 Midday block | | | | |
| | salmon - feeder students only | | Periods 7 & 8 meet from bus arrival (approx 11:50) - 1:20 p.m. block | | | | |
| | | | ** CHS only sections meet from 12:40 - 2:10 | | | | |
| | | | | | | | |
| | | | Double Block sections (1/3 or 2/4) meet from a.m. bus arrival until 10:45 | | | | |

# Appendix G:

# Statement of Insurance

**FAIRFAX COUNTY PUBLIC SCHOOLS**
Risk Management, Office of the Comptroller
Gatehouse Administration Center I
8115 Gatehouse Road
Falls Church, VA 22042-1203

## STATEMENT OF INSURANCE/SELF-INSURANCE

**This statement shall serve to certify both the accuracy of the information as well as the financial ability of the School Board to meet the obligation imposed by the retention levels.**

### PROPERTY

Fairfax County Public Schools (FCPS) purchases coverage from The Lexington Insurance Company to protect its property and other property in the care, custody, and control of FCPS with a self-insured retention of $100,000.

### LIABILITY

Fairfax County Public Schools (FCPS) funds a liability self-insurance plan and assumes the following risks with a self insured retention of $2,000,000 and excess coverage with a $10,000,000 limit for: comprehensive general, vehicle, and school board legal liability coverages. This plan covers the School Board, its employees, approved volunteers, and certain others. Other persons/organizations cannot become additional insureds under the plan.

### INDEMNIFICATION

General counsel to the Fairfax County School Board has concluded that, because school boards in Virginia are immune from tort liability pursuant to the doctrine of sovereign immunity, the School Board cannot contractually assume such liability by way of an indemnification agreement. Without specific statutory authority to do so, the School Board has no legal authority to assume tort liability of another by way of indemnification, or to otherwise waive its sovereign immunity.

### ARBITRATION

Fairfax County Public Schools cannot legally enter into any agreement/contract that specifies arbitration as a means of resolving disputes. Virginia law does provide authority to public bodies to enter into agreements that would utilize alternative dispute resolution procedures; however, such procedures would be non-binding. The Fairfax County Board of Supervisors did not adopt this option (for the School Board) into its Purchasing Resolution.

### STATEMENT OF RESPONSIBILITY

Any property rented, leased, or in any other manner under the care, custody, and control of FCPS will be treated as though it is FCPS property, barring legal contract language to the contrary. Any questions concerning property coverage or liability, based upon FCPS care, custody, and control of property not owned by FCPS, will be dealt with by FCPS as though the questions arose due to an occurrence or situation involving FCPS-owned property.

Signature: Mary Jane Fick

Mary Jane Fick, Coordinator, Risk Management
571-423-3645

Date: 2/6/12

# Appendix H:

# 2011 – 2012 Chantilly Academy Profile

FAIRFAX COUNTY PUBLIC SCHOOLS

# *Chantilly Academy:* *Excellence in Career & Technical Education*

***Profile 2011-2012***

*Fairfax County Public Schools (FCPS)*
*4201 Stringfellow Road, Chantilly, VA 20151*
*www.fcps.edu/chantilly academy*
*Administrator: Douglas Wright*

***Advancing Excellence in Career & Technical Education...***Chantilly Academy is committed to developing the leaders of tomorrow by preparing all students to meet the high academic, scientific and technical skills, civic and workforce challenges of the 21st century. As the largest of six Career & Technical Education Academies in FCPS, Chantilly Academy enrolls more than 1,300 students annually from 20 FCPS division high schools.

As a CTE learning community, we embrace initiative, innovation, planning, collaboration, and teamwork that result in academic rigor, instructional excellence, outstanding student performance and continuous program improvement. The unique learning opportunities at Chantilly Academy effectively launch students toward successful post-secondary and higher education, and careers with relevant and transferable life skills. The Academy offers specialized electives in Engineering & Scientific Technology, Health & Human Services, and Trade & Industry.

## Courses

Air Force JROTC ■ Animal Science ■ Automotive Collision Service ■ Automotive Technology ■ Carpentry ■ Network Design & Engineering/CISCO ■ Computer Systems Technology (A+) ■ Cosmetology ■ Criminal Justice ■ Culinary Arts ■ Dental Careers ■ Early Childhood Careers ■ Engineering Math ■ Engineering Physics 2 ■ Engineering Systems ■ Girls Exploring Engineering ■ Entrepreneurship ■ Exploring Health Sciences ■ Exploring the Language of Medicine ■ Geographic Information Systems ■ Independent Research Engineering ■ IT Seminar ■ Medical Assistant ■ Network Administration ■ Oracle ■ Pharmacy Technician

## Student Benefits

- **In-depth, "hands-on" study of career field by experienced subject expert instructors**
- **State of the art technology and lab facilities**
- **National Certifications and Industry Credentials**
- **Articulated and dual enrollment college credits**
- **Career exploration and preparation**
- **Community Service Learning**
- **Internships, job shadows, field trips, career speakers and professional development workshops**
- **Opportunities for career related college scholarships**
- **Career and Technical Student Organizations**
- **Mentorship and career role models**

## Academy Highlights

**Industry Credentials:** Academy courses prepare students for industry credentialing opportunities. Earning an industry credential demonstrates the professional skill level the student has achieved and provides industry-recognized proof that the student is prepared for career-related responsibilities or post secondary education and training.

Examples include: CompTIA A+ Certifications, Oracle PL/SQL Developer Certified Associate, CCENT & CCNA, NOCTI Certifications, Dental Radiology, First Aid and CPR, Blood-borne Pathogens, Certified Pharmacy Technician, I-Car, NASSSA, Virginia State Cosmetology License, National Restaurant Association ServSafe Sanitation Exam, and OSHA-Career Safe.

**Students Earn Industry Certifications**

**2008-2009 – 16 Certification Exams Available; 359 Certifications Awarded.**

**2009-2010 – 25 Certification Exams Available; 638 Certification Awarded.**

**2010-2011 – 24 Certification Exams Available; 554 Certifications Awarded.**

**Articulated College Credits and Dual Enrollments** enable students to earn college credit for certain Academy classes. Dual Enrollment agreements are in place with Northern Virginia Community College (NVCC), and James Madison University (JMU). Dual enrollment college credits are available for Entrepreneurship (3 Credits), CISCO (16 credits for Levels 1 & 2), Geographic Information Systems (3 credits). Articulated credits are available for Culinary (Art Institute of Washington, Culinary Institute of America, Stratford and Johnson Wales Universities), Engineering Physics, and Engineering Systems 1 (George Mason University).

**Student Population:** Academy students are from 20 different FCPS division high schools, bus transportation may be available to the Academy from the following base high schools: Annandale, Centreville, Chantilly, Fairfax, Falls Church, Herndon, Lake Braddock, Langley, Lee, Madison, McLean, Marshall, Mountain View, Oakton, Robinson, South County, South Lakes, Westfield and Woodson.

**Strategic Business Partnerships:** Thanks to the support of dedicated individuals, community organizations, local businesses, national corporations and post-secondary educational institutions, Chantilly Academy offers programs that are industry relevant and provide a "real-world" bridge to higher education and employment. Partnerships include:

ProFinishes Plus/DuPont; Purdue University- EPICS~High; NVR LLC; Northrop Grumman, Balfour Beatty Construction; The SI Organization; National Reconnaissance Office; Greenbriar West Elementary School; KinderCare; Micron Technology; Lockheed Martin; Orbital Sciences; CVS Pharmacy; Air Force Association Gabriel Chapter; ExxonMobil; SRC Inc.; Rolls-Royce, NA; Associated Builders & Contractors of Virginia; George Washington University School of Engineering & Applied Sciences & School of Medicine and Health Sciences; Inova TDI Inc and Dulles Regional Chamber of Commerce.

**Student Services:** Dedicated staff supports the individual needs of all Academy students; including an administrator, guidance counselor, career experience specialist, 20 program teachers and a team of five Special Education teachers and one ESOL teachers.

**Career Experiences** are available for all students; "hands-on" activities in and out of their classroom provide realistic views of future careers. Throughout the 2010-2011 school year, 2,172 students, along with 106 professional businesses and post-secondary education institutions, were engaged in career experiences: internships, job shadows, mock interviews, resume workshops, mentoring, National Engineers Week guest lecturers, Engineering Expo, Health Sciences Symposium, Academy Career Fair, and the ABCs of Credit Workshop.

**Scholarships and Honors:** Students who become members of Career & Technical student organizations, including SKillsUSA, HOSA, DECA, FCCLA and FIRST Robotics, have access to thousands of dollars in scholarship monies. In 2010-2011, Chantilly Academy students earned a total of $1,374,350 in scholarships.

## Outstanding Student Achievements

- SkillsUSA National Champions, Cosmetology team, Entrepreneurship Team Competition.
- Cosmetology students achieved an 80% pass rate on the Virginia Cosmetology License Exam.
- Entrepreneurship student took 1st place in the Pitch George Competition, sponsored by George Washington University.
- Fifty students competed in the SkillsUSA District Leadership Competition and qualified to compete at the State Competition.
- Fourteen Dental Careers students passed the comprehensive Virginia State Radiology Certification Exam.
- Medical Assistant students were awarded 1st Place in the HOSA Bowl Competition qualifying for the HOSA State Competition.
- Sixteen FCCLA students qualified to compete at the FCCLA State Leadership Competition.
- Six Entrepreneurship students placed in the top 3 at the DECA State Leadership Conference and qualified to advance to the International DECA Competition in Orlando, Florida.
- Auto Technology has been named an Official National Automotive Technicians Education Foundation (NATEF) industry certified and accredited program for Brakes, Electrical/Electronic Systems, Engine Performance and Suspension and Steering.
- Air Force JROTC awarded Distinguished Unit Awards; honored VA 2009, 2010 and 2011.
- Cyber Patriot Competition – sixty-nine students participated in the 2011-2102 AFA CyberPatriot Competition. Students from Computer Systems Technology, Oracle, Cisco, Engineering and the AFJROTC programs were mentored by Northrop Grumman experts in information assurance and cyber security. The Gabriel Chapter of the Air Force Association sponsored teams in competition. Two Open Division Teams advanced to the CyberPatriot National Semi-Finals and were recognized at a Federal IT Job Shadow Day program at the US Pentagon.
- Engineering Projects in Community Service – EPICS High/Purdue University partnership with Chantilly Academy. Thirty-three Girls Exploring Engineering students and alumni piloted an engineering service learning project "Radar for the Blind" with the Virginia Association for the Blind.