

# Heritage High School

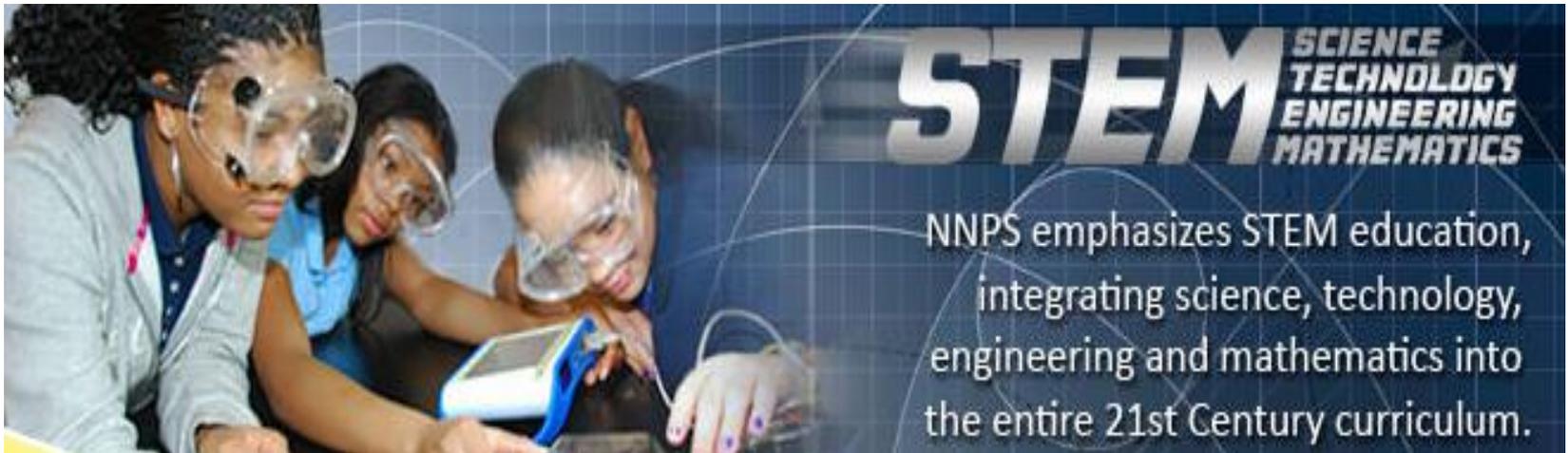


## Governor's STEM Academy Proposal



# **Heritage High School Governor's STEM Academy Mission**

*Unique program that combines academic coursework and research experience with a challenging environment to expand options for students to acquire skills in STEM.*



# Heritage High School Governor's STEM Academy Goals

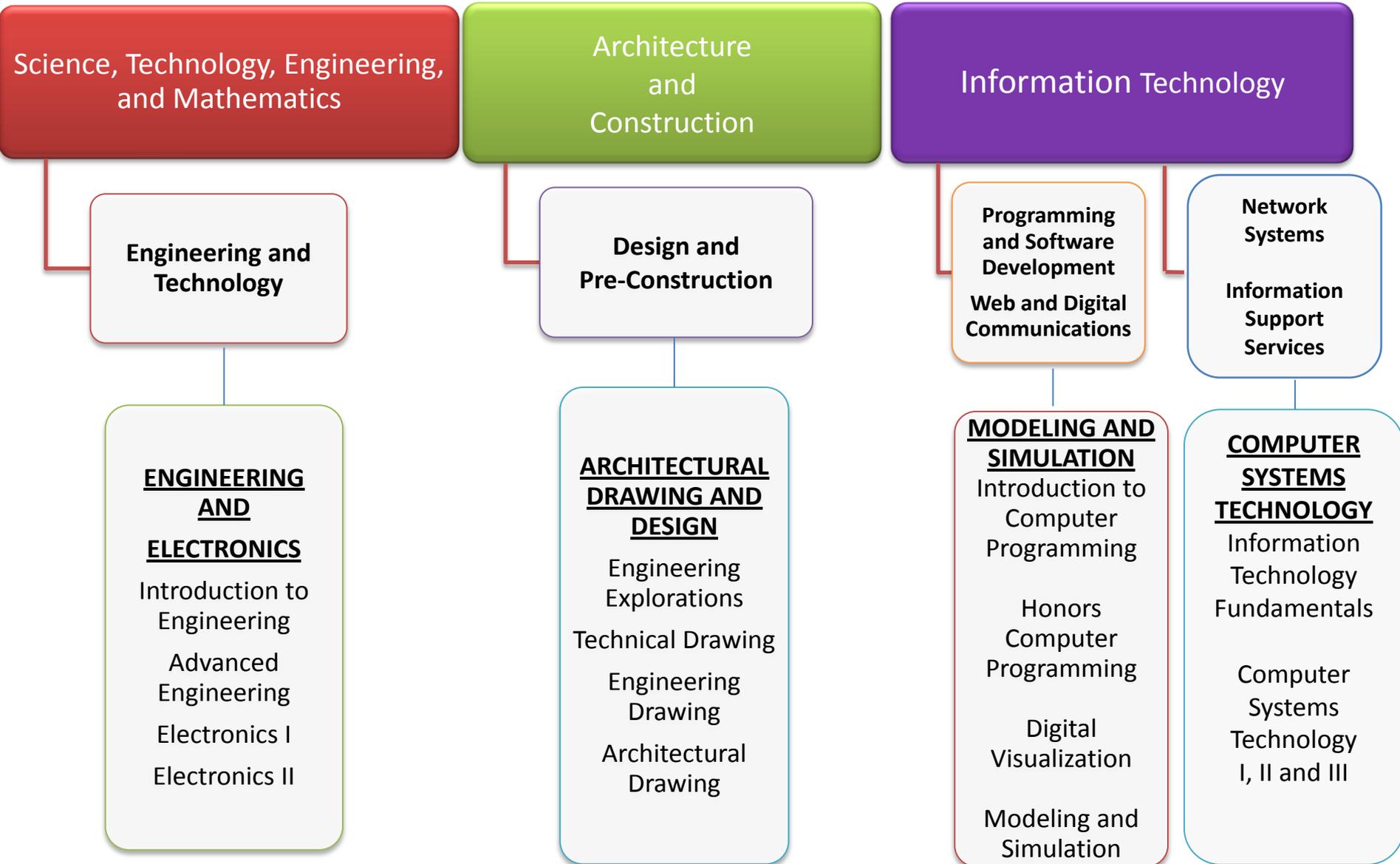
- \* **Promote student achievement and interest in STEM career fields**
- \* **Increase student enrollment**
- \* **Attract more students to postsecondary education in preparation for STEM-related Career Pathways**
- \* **Expand internship and job shadowing opportunities**
- \* **Produce better trained workers to support the recruitment needs of business and industry**
- \* **Offer STEM professional development for teachers**
- \* **Increase connections to families, community partners, and local businesses and industries**

# ***RATIONALE***

- **By 2014, there are expected to be 2 million jobs created in STEM-related fields in the U.S. (Bill and Melinda Gates Foundation)**
- **Virginia produces 28 percent fewer STEM graduates than the work force demands, particularly aerospace engineers, nuclear engineers, electrical engineers and computer support specialists (Chmura, 2012)**
- **11,150 jobs will open in 11 advanced technology and manufacturing occupations, of which 10,000 are at Newport News Shipbuilding (Peninsula Council for Workforce Development)**

# HERITAGE HIGH SCHOOL GOVERNOR'S STEM ACADEMY

## CAREER CLUSTERS, PATHWAYS, and COURSES



# Fastest Growing STEM and Technical Occupations in the United States from 2008 Projected to 2018

Occupation	2008*	2018*	Percentage Growth
Biomedical Engineers	16.0	27.6	72.02%
Network Systems and Data Communications Analysts	292.0	447.8	53.36%
Computer Software Engineers	514.8	689.9	34.01%
Environmental Engineers	54.3	70.9	30.62%
Architects	113.7	141.6	24.00%
Graphic Designers	279.2	316.5	13.00%
Computer Programmers	363.1	406.8	12.01%

**\*Numbers in thousands**

**Source: Bureau of Labor Statistics [www.bls.gov](http://www.bls.gov) February 2012**

# PROGRAM AREAS AND COURSES

## ➤ Engineering and Electronics

- Introduction to Engineering (8460)
- Advanced Engineering (8491)
- Electronics Systems I (8416)
- Electronics Systems II (8412)

## ➤ Architecture/Engineering Design

- Engineering Explorations (8450)
- Basic Technical Drawing (8435)
- Engineering Drawing (8436)
- Architectural Drawing (8437)

## ➤ Computer Systems Technology (Networking)

- Information Technology Fundamentals (6670)
- Computer Systems Technology I (8622)
- Computer Systems Technology II (8623)
- Computer Systems Technology III (8624)

## ➤ Modeling & Simulation (Computer Science/Game Design)

- Introduction to Computer Programming (3181)
- Honors Computer Programming (3182)
- Digital Visualization (8459)
- Modeling and Simulation (8460)



# Engineering and Electronics

Students in the introduction and advanced engineering classes will explore the careers and challenges of engineering. While studying electronics, students will be actively involved with high-tech electronic devices. Models, systems, and projects will be designed that creatively solve engineering and electrical problems.



## ***Possible Careers:***

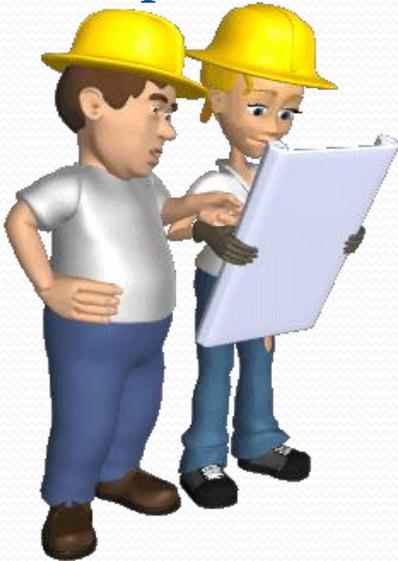
*Civil Engineer, Mechanical Engineer, Chemical Engineer, Electricians,  
Computer Repairers and Installers*

## ***Related Industry Certifications:***

*Pre-Engineering Assessment, Electronic Technology Assessment, Basic Installation Technician*

# Architectural/ Engineering Design

Students learn the principles of architecture and construction techniques. Computer-aided drawing and design equipment will be used to prepare models for presentation.



## ***Possible Careers:***

*Architect, Computer-Aided Drafter, Mechanical Engineer, Computer Information Systems Manager/Designer, Landscape Designer*

## ***Related Industry Certifications:***

*AUTOCAD, Skills USA Workforce Ready Technical Drafting Assessment*

# Computer Systems Technology (Networking)

Students learn to diagnose and demonstrate networking concepts, understand troubleshooting procedures, and implement and manage network security measures.



## ***Possible Careers:***

*Network Administrator, PC Support Specialist, Security Administrator, Data Communications Analyst, Telecommunications Network Technician*

## ***Related Industry Certifications:***

*Microsoft Technology Associate, CompTIA A+, CompTIA Network+, CompTIA A+IT Technician*

# Modeling and Simulation

## (Computer Science and Game Design)

Students learn programming languages and computer animation. Modeling, simulation, and game development software will be used to solve real-world problems in STEM.



### **Possible Careers:**

*Computer Programmer, Game Programmer, Applications Engineer, Web Designer, Graphic Artist, Multimedia Producer, 3D Animator, Operating Systems Engineer*

### **Related Industry Certifications:**

*IC3, Microsoft Technology Associate, Microsoft Office Specialist*

# DUAL ENROLLMENT OPPORTUNITIES

## COLLEGE CREDIT NOW!

**AP English**

**AP Physics**

**AP Environmental Science**

**AP World History**

**AP US Government**

**AP Calculus**

**AP US History**

**Electronics Systems I**

**Engineering Drawing**

**Computer Systems Technology II**

**Introduction to Engineering**

**Information Technology Fundamentals**



**EARLY COLLEGE PROGRAM**

# STEM ACADEMY GOALS

- **Increase the number of Academy students who earn a grade of B or better in advanced mathematics courses beyond Algebra II by 3 percent over the next four years**
- **Increase the number of Academy students meeting the requirements of the Advanced Studies Diploma by 10 percent over the next four years**
- **Increase the number of Academy students earning industry certifications by 10 percent over the next four years**
- **Increase the number of postsecondary credits earned through dual enrollment, advanced placement courses, and the Early College program by 5 percent over the next four years**
- **Ensure that 100 percent of Academy students participate in workplace readiness and job shadowing activities through strong partnerships with businesses and organizations**

# STEM ACADEMY GOALS

- **Increase our school's graduation rate by 3 percent over the next four years**
- **Reduce our school's dropout rate by 2 percent over the next four years**
- **Increase enrollment and retention in postsecondary education by 5 percent over the next four years**
- **Increase the proportion of Academy students completing a college and workplace ready curriculum in high school annually by 5 percent**
- **Reduce the proportion of Academy students requiring remediation in college annually by 5 percent**
- **Increase the number of Academy graduates employed in high-wage, high-demand, and high-skill careers. Approximately 60 percent of Academy graduates will obtain employment within identified career pathways and related occupations following postsecondary education as evidenced by a follow-up survey.**

# PERFORMANCE MEASURES

- **Student grade reports**
- **Number of industry certifications earned**
- **Postsecondary credits earned**
- **Internship and job shadowing student placements**
- **Division graduation index reports**
- **Student program enrollment reports**
- **CTE Follow-Up Survey Data**
- **Local Surveys (including 3-4 year follow-up)**

# BASELINE DATA 2011-2012

## Industry Certifications, Postsecondary Credits and Workplace Readiness Experiences

Number of industry certifications earned	105
Number of postsecondary credits earned (dual enrollment/ advanced placement/ Early College)	172
Number of students participating in workplace readiness experiences (job shadowing/ internships)	79

## Advanced Mathematics Students Earning a Grade of B or Better

ADVANCED MATHEMATICS COURSE	NUMBER OF STUDENTS
Honors Algebra II/ Trigonometry I	27
Honors Math Analysis I	12
Trigonometry and Elementary Functions	51
Probability and Statistics I	10
Advanced Placement Calculus	17
<b>TOTAL STUDENTS</b>	<b>117</b>

## Graduation and Drop Out Rate

Graduation Completion Index	85.42%
On-Time Graduation	84.57%
On-Time Graduation Drop-Out Rate	6.65%

# RECRUITMENT

- Elementary and Middle School Visitations
- Open Houses and Orientations
- Videos
- Flyers and Brochures
- Social Media
- STEM Expos
- Student and Parent Nights
- Guest Speakers
- Career Fairs
- Workshop
- Summer Camps



# ADMINISTRATIVE PROCEDURES

## Students Served

- 150 students selected for the 2013-2014 school year
- 350-400 students in grades 9-12 over the next 3-4 years

## Staff

- VA Teacher Licensure/Postsecondary Qualifications
- Applicable industry certifications
- Participate in STEM-related staff development to include summer institutes and conferences

## Student Transportation

- Provided for all students who are Newport News residents accepted into the Academy

## Fiscal Agent/Budget

- Newport News Public Schools (school division resources, grants, Perkins fund, in-kind donations from business partners)

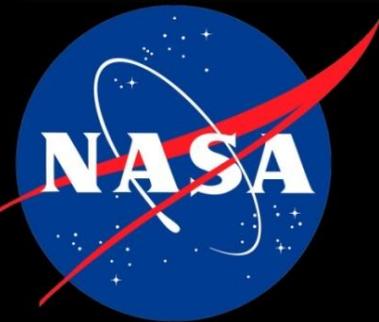
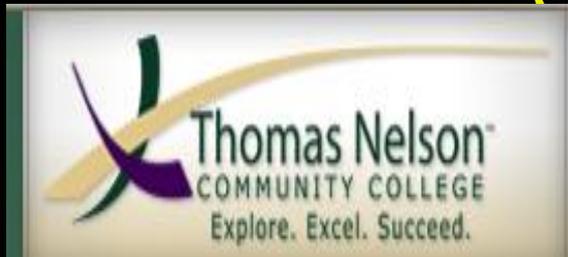
# ADMISSIONS and AGREEMENTS

## **Student Application Process**

- ✓ Complete Governor's STEM Academy Application and Agreement Form
- ✓ Compose STEM Essay

## **Academy Students Will Be Required To Meet The Following Criteria:**

- ✓ Complete an advanced mathematics course beyond Algebra II
- ✓ Maintain a minimum of a 3.0 GPA
- ✓ Take a math, science, and technology course each year
- ✓ Complete courses within STEM, Information Technology or Architecture and Construction career clusters
- ✓ Complete a STEM-related internship (minimum 15 hrs.)
- ✓ Complete a Senior STEMinar Course (college and career readiness/public speaking/final STEM project)
- ✓ Complete 200 hours of school/community service
- ✓ Earn an industry certification and at least 9 transferrable college credits



# WORK BASED LEARNING EXPERIENCES

- ▶ Internships
- ▶ Job Shadowing
- ▶ Leadership Institutes
- ▶ Mentorship Programs
- ▶ Career and Technical Student Organizations
- ▶ Community Service
- ▶ Showcases
- ▶ STEM Summer of Innovation



# CURRENTS

A weekly publication of Newport News Shipbuilding



## **NNS Brings Benefits of STEM to Life for Area Students**



**Career Day**



**Dominion**

**Kid Wind Turbine Challenge**



**Engineering Designs Sponsored by**



**NOAA**

NATIONAL OCEANIC AND  
ATMOSPHERIC ADMINISTRATION  
UNITED STATES DEPARTMENT OF COMMERCE



**Jefferson Lab**

**Introduce a Girl to Engineering**

