



Career Academies
of the Wake County Public School System



WAKE COUNTY
PUBLIC SCHOOL SYSTEM

Southeast Raleigh Magnet

Engineering Career Academy Newsletter

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Notice of Non-Discrimination:
In compliance with federal law, Wake County Public School System administers all education programs, employment activities and admissions without discrimination against any person on the basis of gender, race, color, religion, national origin, age or disability.

Get a Good Grip and Hold on Tight!!

From the Desk of the Coordinator:

Wow, what a summer and start to the new year. This summer I was fortunate enough to be selected to participate in an internship of my own. It was with the AS-SIST program at NCSU. For five weeks I was learning about wearable sensors and harvesting energy from the body. I will present this information to the EDD class and hopefully some of them will choose it for their project. I also attended the NAF national conference in Anaheim California. This was a great experience to find out more about the benefits of being a NAF certified school, making connections and learning from other schools around the country.

In August, we inducted 40 freshman into the Engineering Academy. It was a very nice ceremony and it seemed like the students really enjoyed it.

We applied for, and were selected into the Lenovo Scholars Network APP development challenge. We have 23 students on our team divided into smaller teams of 4 to 5 students.

No more field trips . . . They are called Offsite Learning Experiences or OLE's. We have been on 3 so far and have 4 more planned for this semester.

Students need to check their e-mail frequently so they don't miss out on any opportunities.

Do you shop at Amazon.com?

If so, Amazon will give the Engineering Academy money.

Amazon Smile is the part of their organization that donates a percentage of sales to tax exempt businesses.

We will get .5% of sales on SmileAmazon.com when you use this site:

<https://smile.amazon.com/ch/46-0953611>

Important Dates:

Gaming and IT OLE - 11/6

Magnet Fair - 11/7

GE Aviation OLE - 11/10

Graduation Projects - 11/12

College/Career Fair - 11/13

Met Life Job Shadowing - 11/16

Magnet Open House - 12/3

Final Exams - 12/11 - 12/18

My Internship

ASSIST at NCSU

ASSIST - Advanced Self-Powered Systems of Integrated Sensors and Technologies....That's a mouthful. It's no wonder why we refer to it as ASSIST.

This was a great experience. We started by learning about different types of sensors. We mainly worked with the Texas Instruments TI Tag Sensor and the Arduino Lilypad. These devices have awesome capabilities; they have IR Temperature Sensor, Humidity Sensor, Pressure Sensor, Accelerometer, Gyroscope and Magnetometer.

We then were divided into groups of 4 to start our OneHealth project. We were to design a wearable device for a human or animal to monitor a health condition and if possible make it self-powered.

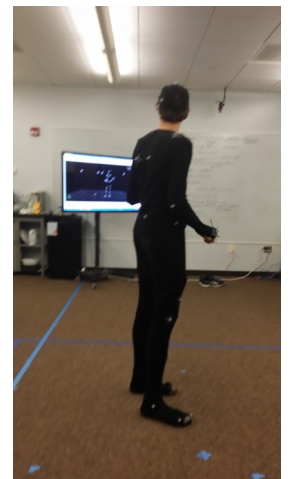
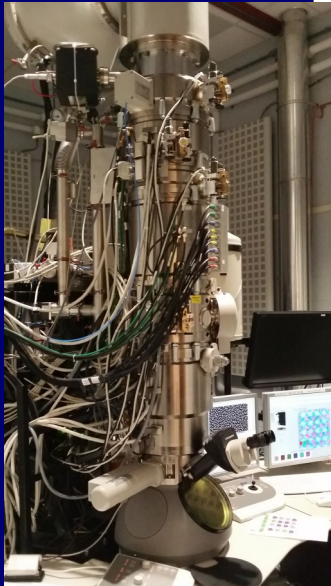
Our device was supposed to help people with balance issues like MS or stroke patients. Our project is shown on the next page.

Also during the 5 weeks we were able to tour the amazing research facilities where they have multi-million dollar electron microscopes, clean rooms and motion capture rooms.

This internship was also available for students. In

fact, there was a former SRMHS Engineering Academy student there and a current Bio-Med

Academy student with us. This was a paid internship so if you are interested please let me know.



For more information about ASSIST: <https://assist.ncsu.edu/>

For more information about OneHealth: <http://assistonehealth.com/>

ASSIST at NCSU cont'



ASSIST 2015 Summer Experience



John Geraghty – ASSIST RET
Engineering Academy Coordinator at Southeast Raleigh Magnet High School.

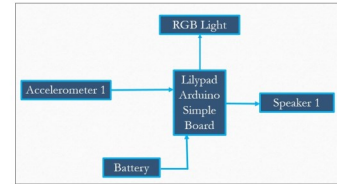
One-Health Research Project



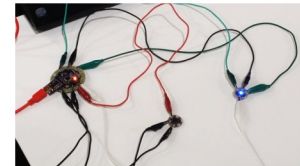
Essential Question – How can sensors be used to assist people with balance issues; MS patients, the elderly and/or stroke patients?

Project Description - A shirt is outfitted with a Lilypad Arduino control board along with an accelerometer, RGB light, battery and speaker. When the subject wearing the shirt starts to fall the light will light up.

One Health - dedicated to improving the lives of all species—human and animal—through the integration of human medicine, veterinary medicine and environmental science. This device will help millions of people with balance issues.



Block Diagram



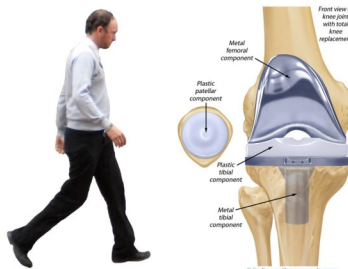
Mock up

Knee Rehab

Students will use the design process to develop a test using the TI Sensor Tag to measure the movement of a person walking.

They will take this information and use it to help people rehabilitate from knee surgery.

They will create a "game" that patients will use to help with their gait.

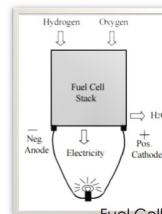


Hydrogen Fuel Cell

Can we harvest energy from water?

This demonstration will show how a hydrogen fuel cell converts chemical energy into electrical energy.

- Students will learn about the particle nature of the element Hydrogen and its compounds.
- Students will learn about how hydrogen fuel cells can create electricity.
- Students will develop an understanding about the chemical reactions involved in hydrogen fuel cells.



Hydrogen Fuel Cell Car

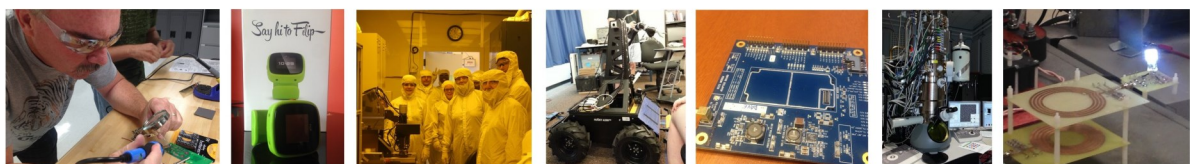
Medieval Weapons of Siege

After researching Medieval Weapons of Siege, the students will construct a medieval machine and perform experiments with distance and mass.

- The students will develop an understanding of the weapons of siege used during the medieval time period.
- The students will use mind mapping to break down their siege weapon and learn how it works.
- The students will construct their siege weapon.
- The students will compete against each other in various events; distance, accuracy and predictability.
- The students will construct a presentation which outlines the Design Process used for this activity and what they learned from the history of siege weapons.



Trebuchet



The 4 C's

Collaboration

Communication

Creativity

Critical
Thinking

Lenovo Scholar Network

On September 23rd we had the Kickoff Event for the Lenovo Scholar Network App Development Challenge. After some kind words from Ms. Karen Ondrick from Lenovo our students were presented with 10 ThinkPad laptops and 10 YOGA 2 Tablets to aid in learning to build apps. The short ceremony went well, then we were going to have a round table discussion with some Lenovo executives but the FIRE ALARM went off.



We had to evacuate the building but in true Bulldog fashion, we rolled with the changes, as we held an impromptu “round table” outside in the parking lot with Yolanda Conyers, the VP of Worldwide Human Resources and Chief Diversity Officer for Lenovo. The students were hanging on every word she had to say.

Also in attendance at the kick off was:

Bill Taylor—Associate VP of Network Engagement with NAF.

Mrs. Christine Kushner—WCPSS Board Chair

Dr. Clinton Robinson - Southwestern Area Superintendent WCPSS

What is the App Challenge?

Lenovo Scholar Network cont'

Our 23 students join students at 29 other U.S. schools partnering in Lenovo's mobile app development project.

The students will learn to work in teams and compete against other student teams. They develop their apps from October through February, compete locally and nationally in March/April and the top 10 teams are selected by the end of April.

Voting for the Fan Favorite occurs in May and June, with the national award for the Fan Favorite mobile app presented to the winning student team at the annual NAF Next conference in July.

Through the Lenovo Scholar Network, students are given the opportunity to participate in mobile app development experiences that provide them with the knowledge, re-

sources and practical experience to support their college and future career success.

The network prepares the next generation of developers and entrepreneurs through a rich application development curriculum using Lenovo technology.

When students complete their work in the network and demonstrate mastery of the skills/objectives of Lenovo Scholar Network, they earn the Lenovo App Scholar badge.



FIELD TRIPS

Offsite Learning Experiences

We have changed the way we take OLE's. In the past we would take a whole class of students, for example the entire POE class would go to the Harris Nuclear Plant. However, some of the students in that class are not academy students. Since I am planning and organizing the trip and also to make the academy more meaningful, I only want academy students going on OLE's. Therefore it is imperative that students check their e-mails often or they might miss out on an opportunity.

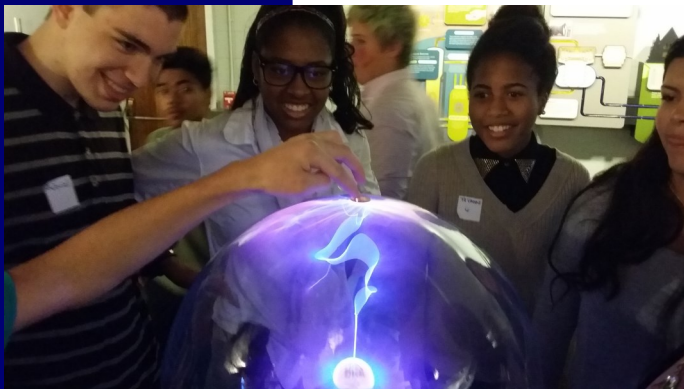


Duke Energy Progress - Harris Nuclear Plant

Students got to walk around the hands on exhibits to learn about power generating and distribution.

Then they toured the failure analysis lab where it's like CSI for products.

Afterward Andy taught them about the company and about Nuclear power.



Internships



Cae Williams completed his internship this summer at Cisco.

His internship consisted of 4 main activities:

Guest Speakers - Cisco Executives,
Shadow Mentors - What it's like to work at Cisco,
Lab Training Mentors,
STEM Technology Project.



He learned a lot about Networking: the physical elements of a network (Cabling, hubs, switches and routers), IP addresses, gateways, VLANs and how to configure an integrated network.

Cae also learned about robotics: Designed an EV3 robot, EV3 programming using Lego Mindstorm. Used host-to-host RDP session to encode robot across an IP network, and how to troubleshoot, debug and redesign robots and programs.

He worked in a team and their project was to design, build and program an EV3 robot to successfully navigate an obstacle course using the RDP session to remotely program their robot over their IP network.



**DUKE
GLOBAL HEALTH
INSTITUTE**

Robert Kempin completed his internship at the Duke Engineering World Health Organization, under Dr. Robert Malkin. He was given a task that was twofold in nature, and involved both computer and electrical engineering.

The first part of the project was to write example code for a plethora of sensors that interfaced with a raspberry pi and that could be used to create medical sensors. The second part of the project was to design a prototyping breakout circuit board that interfaced with the raspberry pi platform and could be used to design circuits on both bread boards and soldered onto the breakout board itself. Robert learned a lot and really enjoyed the experience.

Internships cont'

How do you get an internship?

Your family's contacts and family friend's contacts are usually the best sources for providing information on potential internship sites. Having family members reach out to their contacts is a great way to use networking to find an internship site. This source is often the easiest way to secure an internship because in most cases, family friends already know you and what kind of student you are.

Another way to find internship site is to complete an Internet search using Google to find local companies of the type you would like to intern with. Once you find companies or organizations that you are interested in, you will need to contact a decision maker at that company/organization to see if they will host you as an intern.

You can also use one of the following sites to find companies/organizations

www.bbb.org (search for companies in the Raleigh-Durham area)

www.raleighchamber.org (look at the business directory)

If you still need help, schedule some time to sit down with Mr. Geraghty discuss what you desire. He will help you to sort it all out and work on some contacts. He will need to know if you have your own transportation and when you can work.



Internships cont'

Responsible

Confident

Sociable

Self-Managing

Honest

Ethical

Dependable

Employers expect the Intern to:

- Come to work on time.
- Make smart decisions.
- Follow directions.
- Concentrate on my work and care about the quality of my work.
- Read, write, and calculate well.
- Recognize problems and find solutions.
- Finish a job when I'm supposed to without sacrificing quality.
- Be honest and dependable.
- Take the lead and work hard.
- Communicate well and get along with other people, especially customers.
- Dress properly and practice good grooming.
- Be cooperative.
- Have a positive attitude.

The Parents/Guardian agrees to:

1. Provide transportation for the student to and from the internship location.
2. Encourage the student to complete all requirements of the internship program.
3. Provide automobile, health and accident insurance for the student.
4. Report any concerns regarding internship to the Internship Coordinator.

Summer Internship Possibilities

D.O.T.

Verizon

V-Foundation

Cisco

Fidelity

Lenovo

Device
Solutions

Porticos

NCSU
ASSIST

Internship cont'

During the internship, as a student intern you will:

- Develop and complete learning objectives (with your mentor). Track and complete of a minimum of 135 contact hours. Hours are maintained on a timesheet.
- Complete at least 10 written journal entries - reflective of the learning experience.
- Maintain regular communication with the Academy Coordinator at Southeast Raleigh Magnet High School, Mr. Geraghty (jgeraghty@wcpss.net)
- Mr. Geraghty will complete one site visit during the internship.

After the internship you will:

- Develop a summary of the internship experience in PowerPoint, Prezi or through a video
- Present the electronic summary to the Academy Board.
- Complete an evaluation about the internship experience.
- Ask your mentor to complete an evaluation, rating my performance during the internship.
- Based on completion, the Academy Coordinator, Mr. Geraghty, will award a grade and class credit to my high school transcript.

We still have about 7 seniors who have not completed their internship. They will not graduate with Academy credentials if they don't complete an internship.

internships

personal development

confidence

initiative

cv boost

project management

career development

team working

interview ideas

great opportunity

employability skills

liaising

responsibility

interpersonal skills

communicating

decision making

career plan

Cisco

KMPG

Verizon

Lenovo

HP

EMC²

AT&T

What is NAF?

History: NAF started with an Academy of Finance in 1982 in New York.

Currently 667 NAF Academies serving 82,000 students in 38 states.

In 2014 – 97% of NAF students graduated and 93% went on to higher education.

We became a NAF Academy during the 2013-2014 school year

Benefits of being a NAF Certified School:

Access to a network of partner companies: Cisco, KMPG, Verizon, Lenovo, HP, EMC², AT&T etc.

NAFTrack Certification (Explained on the next page)

Other NAF Academies in WCPSS:

Apex - Academy of Information Technology

Enloe - Academy of Health Sciences

Sanderson - Academy of Finance



***BE FUTURE
READY***

ACADEMY OF ENGINEERING

NAFTrack Certification

NAFTrack Certification is achieved through an online system created by education and business leaders to assess college and career readiness. Student performance is measured not only through end-of-course exams, but also through culminating projects and internships.

1. Culminating Projects

Since NAF courses revolve around a culminating project, students work throughout the semester uploading work samples and answering 5 reflection questions per sample. These work samples illustrate mastery of content, progress of project work, and a variety of skills including collaboration and innovation. Each NAF course has a culminating project, but academies may choose other approved certification pathways that do not include a culminating project.

2. End-of-Course Exams

For our Engineering Academy classes we use the Project Lead the Way end of course exams.

3. Internship Assessment

Students are assessed by their internship provider. Internship requirements include: No less than federal (or local, if higher) sub-minimum training wage; 120 hours that may consist of two 60+ hour internships; Direct supervision by an adult who is not the student's teacher; Work produced is of value to the employer; Written individualized learning plan targeted to work-based learning outcomes.



NAFTrack Certification cont'

Students can get NAFTrack certified if:

- Earn a B or better in all Academy classes
- Score a 5 on the PLTW end of course assessment
- Complete a **PAID** internship of at least 120 hours

Benefits of NAFTrack Certification:

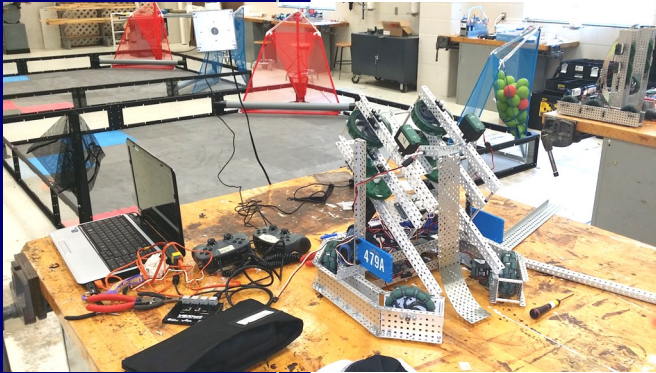
- Pre-interview and resume support as well as post interview feedback and coaching.
- Guaranteed job interview and priority hiring
- Potentially higher starting salary
- Potentially expedited advancement in the hiring process
- Priority hiring among equally qualified applicant pools
- Paid high school and college internship opportunities



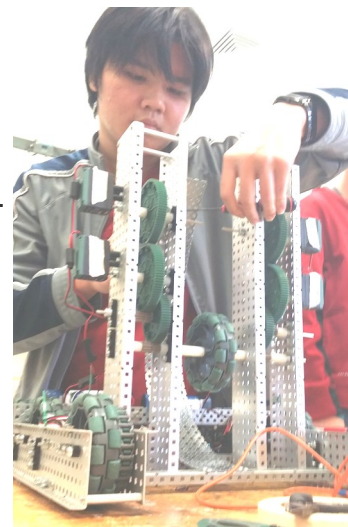
VEX Robotics



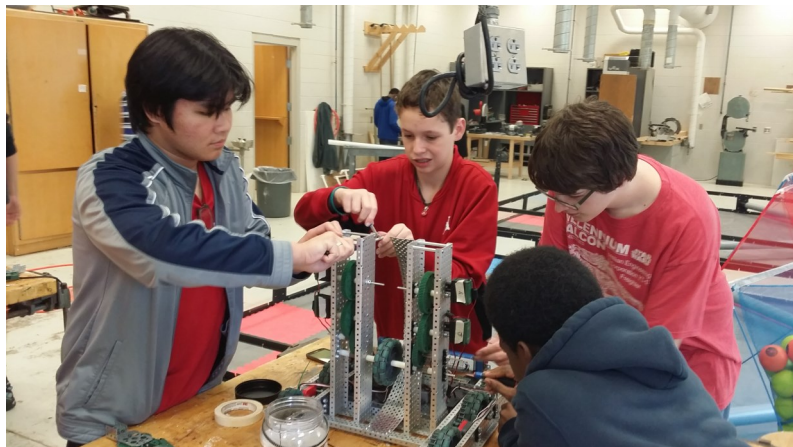
If you haven't been down to room 315 recently, you owe it to yourself to go see the new lab. Mr. Beatty and his VEX robotics team, Southpaw Robotics Team 479, has been hard at work transforming the old wood shop into a high tech robotics building and competition lab. With support from the WCPSS, fundraising and donations from organizations like: Google, EMC², Cape Fear Otolaryngology, and Classroom World-wide, Mr. Beatty has been able to purchase 2 complete competition rings and a lot of supplies to build the robots.



There are 24 students on the team and they meet every Thursday after school until 4:00. During this time they learn about how to build a completion robot, programming and strategy of the game. The team will host a regional competition in November.



Help support the team by participating in their fundraiser on Dec. 2nd at 6pm at Defy Gravity Raleigh, a Trampoline park.

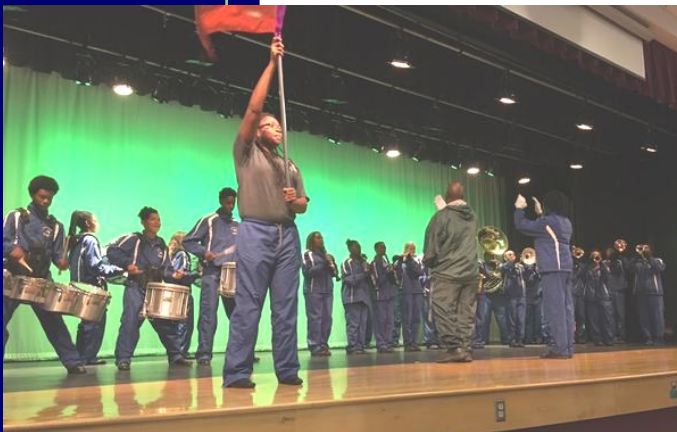


For more information about the team, competitions or fundraising, go to <http://www.southpawrobotics.org/>

Outreach / Recruiting



The month of October has been very busy with recruitment trips to middle schools. Being a magnet school it is imperative that we get the word out to all the 8th graders in the county what a great school we have. Our magnet coordinator, Ms. Audette organizes all the trips and she invites our student leaders to present the students. Each visit is different where we bring a combination of representatives from the following organizations: Band, FIRST robotics, New Tech, Visual Arts, VEX robotics, Performing Arts and all three Academies.



The students do an amazing job presenting to a small group or even a whole 8th grade class of 350. So far the schools we have visited are: Centennial, West Lake (twice), Heritage, Apex, Ligon, Moore Square and Lufkin. In November we will go back to Heritage for their other tracks and also Rolesville. We end by inviting them all to the Magnet Fair on November 7th.



Advisory Board Update

Parents, GET INVOLVED!!

I know many of you would love to get involved but are not sure what you could do.

Here's a list of things you could do:

- Become a volunteer -
As a volunteer you could be a guest speaker in a class, participate in mock interviews, help out with career readiness workshops or just help out in the classroom.
- Be a chaperone -
We go on a multitude of Offsite Learning Opportunities and we are always in need of chaperones.
- Ask your company to offer field trips, job shadowing and/or internships.
- Join the Academy Board -
Help set the direction of the academy by working with other parents and industry leaders who see the value in the academy.
Our meeting dates are: 11/30, 1/11, 2/22, 3/21, 4/18, 5/16
- To volunteer for any of these opportunities or if you have any questions, e-mail Mr. Geraghty

Important Links and Information

Mr. Geraghty - jgeraghty@wcpss.net

Mr. Beatty - tbeatty@wcpss.net
Class Site - <http://mrbeattysclass.weebly.com/>

Mr. Eckenrod - eeckenrod@wcpss.net
Class Site - <http://mreclass.weebly.com/>

Mrs. Laing - dlaing2@wcpss.net
Class Site - <http://mrslaing.weebly.com>

Follow the Engineering Academy on Twitter
[@SEengAcademy1](https://twitter.com/SEengAcademy1)

<http://southeastraleigheaab.weebly.com/>

Key for the Academy Acronyms

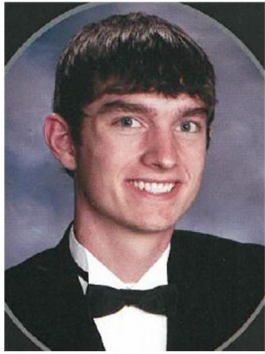
PLTW - Project Lead the Way

IED - Introduction to Engineering Design
POE - Principles of Engineering
DE - Digital Electronics
AE - Aerospace Engineering
CEA - Civil Engineering and Architecture
EDD - Engineering Design and Development

NAF - National Academy Foundation

CDC - Career Development Coordinator
CA - Career Academy
CDF - Career Development Facilitator

Graduate Spotlight



Adam Forcum Class of 2009

Mechanical Engineer

“My job consists mainly of design engineering work using Solidworks, so learning and becoming decently familiar with Autodesk Inventor so early on was a great advantage not only at work now but also during college.”

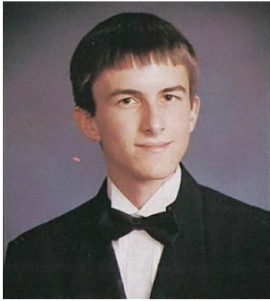
“Looking back, the Friday design competitions where we were given a challenge and told to create a design and then build it using allowed materials, followed a pretty similar process to what it is like here at work now, albeit a considerably simplified and fast-forwarded version.”

“I played lacrosse showed me the importance of working on a team. All the jobs I've worked have the team factor built in somewhere. Whether you are working together on a design, providing a machinist with drawings,....everyone is either relying on someone or relied upon by someone to perform their part correctly.”





Graduate Spotlight



Corey Vernier - Class of 2001

Manager of Rail Engineer - HNTB

“I manage the efforts required to deliver rail design projects and construction oversight projects for various rail clients in NC, particularly NCDOT Rail Division.”

“Taking AutoCAD and 3D Animation helped me develop an ability to see designs/objects in 3 dimensions. This skill is particularly useful in the civil engineering field where complex projects require the early identification of conflicts between proposed designs as well as existing conditions.”

“I participated in the FIRST robotics program for two years as a member of the Animation team. This was my first (non-sport) team project where I begin to learn how to interact with a design team working on a common goal. This experience also helped me gain an early appreciation of how different people bring different perspectives to any given task and how to best leverage individual strengths and minimize weaknesses.”

