



Wallace H. Coulter School of Engineering
Department of Mechanical and Aeronautical Engineering
P. O. Box 5725 · CAMP Building
Potsdam, New York 13699-5725
Phone: 315-268-3885 · Fax: 315-268-6438/6695

February 14, 2010

Cape Cod Regional Technical High School
351 Pleasant Lake Ave.
Harwich, MA. 02645

Dear Friends at Cape Cod Tech,

I have been meaning to do this for awhile. I would like to dispel a few myths about Cape Cod Tech and the prospect of college-bound graduates.

Let me begin by saying that I take tremendous pride in the fact that I went to a technical high school. Whenever the topic is brought up, I always share my story. Most of my friends at college had a scathing high school experience and I feel sorry for them. The Tech, of course, had its normal high school social anxieties, but it was more of a brotherhood of technicians, than a formal high school. I remember "talking shop" at lunch, playing pranks on neighboring departments, and building some ridiculous things to impress my non-tech friends. It was really a once in a lifetime experience. The mixture of teenage ambition and technical education is fertile ground for pure genius and discovery.

I first heard of the Tech in middle school. Looking back on it now, it seems that many of my teachers really didn't have a clue about CCT. It was just some "other place" where the non-college bound kids went. Its actually quite upsetting to think about it. I mean, kids believe whatever adults say, for the most part. As an impressionable 13 year old, I didn't even consider the Tech, after being exposed to all of that negativity. It may have just been my middle school though. I hope things have changed since then. Anyways, I attended Barnstable High School for freshman year. On weekends, I would hang out with my friends Rick and Greg who attended the Tech. Rick was in HVAC and Greg was in Graphic Arts. I envied their newly acquired technical skills so much, that I convinced my mom to let me apply. I entered the Electronics shop as a sophomore.

The Tech nurtured an environment where learning was a byproduct of accomplishing goals. I could not have received better preparation for engineering school or college in general. I remember getting my first real job through the Tech, as a machinist at "Downeaster Wind and Weather" in Dennis. I became their expert coil winder for anemometers. This provided me with some much needed cash later on, when I came home from college during winter and (some) summer breaks.

Of course there were obstacles, but this is true for any high school student. I needed to take evening math courses at Cape Cod Community College before even applying to some engineering schools. I actually did this through CCT. If I kept my grades up, they even helped to pay for the courses and gave me high school (and college) credit for taking them. I applied to all of the top engineering schools nearby and was accepted by my first choice, Clarkson University in Potsdam, NY (30 miles south of Canada). I remember listing Clarkson as my first choice because of their association with NASA. I graduated from CCT in the summer of 2000 with a diploma and a certificate in Electronics.

When I arrived at Clarkson, the dean asked me into his office. He told me that they have never received an application from Cape Cod Tech. He also told me that I should represent my school well, and should not make (Clarkson) regret their decision. To be honest, the first semester was rough. I was disappointed in the lack of hands-on experience. I was disheartened to learn that I wouldn't have labs until sophomore year. Don't get me wrong, I loved physics and calculus. I just needed to visualize things. I took a co-calculus course during lunch, offered to students who needed to re-enforce their math background. I quickly formed study groups with my peers. I caught on very quickly and was well prepared. Cape Cod Tech not only taught me electrical theory, but also how to learn difficult material in a fast-paced environment.

By the time second semester rolled around, things looked much better. Physics II was electricity and magnetism. This was something I had no trouble visualizing, since most of the test problems and homework assignments were based on circuits I had already built during high school. I made the dean's list that semester and became a physics tutor over the next four years. In the summer of 2004, I graduated with a B.S. in Mechanical Engineering and a minor in Mathematics.

Still looking towards NASA, I decided to go to graduate school under the guidance of Dr. Brian Helenbrook and Dr. S. P. Lin, a world renowned expert in microgravity fluid dynamics. I stayed at Clarkson, first obtaining my Master's of Engineering in 2005 and then continuing on towards my PhD. At first, funding wasn't available, so I spent the first summer and christmas break with my mom on the Cape, working as a machinist at Downeaster.

In 2006, I was granted a fellowship with the National Science Foundation, whose focus was to introduce engineering to the local middle schools and high schools. It felt like I was finally giving something back. I designed and taught a number of hands-on lessons that ranged from the 8th-12th grade level. The students worked in groups to build motors, salt-water batteries, and fuel cells. We even arranged after-school "green teams", where students could build their own 6 ft. windmills. I developed a flair for teaching in an applied way. It is no coincidence that my teachers at the Tech upheld this same philosophy.

On the research front, I felt like I was back at CCT and was in perpetual shop week. It was awesome! My

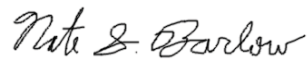
research topic was impinging liquid jets. Think of holding a spoon under the faucet. A circular liquid sheet forms around the spoon and produces droplets which then fall into the sink. In a rocket engine, the size of these droplets affects engine efficiency. After spending months in the lab, we finally made a breakthrough in modeling this process. After giving talks across the US and Canada, I eventually won a student paper award to travel to Kyoto, Japan and present my research to the world. My first paper was accepted for publication in the spring of 2008. I have had two other papers accepted since then, both concerning liquid sheets.

By then, my NSF grant had run out, and I was offered a teaching position in the Mathematics Department. I have been teaching large lecture sections of “Differential Equations” ever since. But I have been doing it my way, or I should say , the “Tech way”. I often bring in demos with springs, water waves, vibrating plates, and I even utilize 3-D glasses to illustrate certain points.

This past December, I graduated with my PhD in Mechanical Engineering. I am currently applying for research jobs for the fall, while continuing to teach at Clarkson. I will be getting married in May. I am 27 years old.

So, that is my story. I would like to point out that I was not in the top 10% of my graduating high school class. I took hard classes and did well, as opposed to breezing through easy classes. I attribute my success mostly to hard work. But it would not have even been possible without the support of my family and Cape Cod Tech. The guidance department at CCT was a huge help in finding scholarships to apply for; many of which I ended up getting. The teachers were so encouraging. Next time I am on the Cape, I’d like to stop by and see if any of them are still there, so I can personally show my thanks. Its been way too long...

Sincerely,



Nathaniel S. Barlow
PhD, Mechanical Engineering

