University of Alaska Anchorage – School of Engineering

Engineering A151 – Introduction to Engineering – Fall 2012

My Process for Becoming a "World-Class" Engineering Student

by

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Introduction

The highest priority goal at this time in my life is to graduate with a degree in engineering. This is no easy task, but if the right approach and proper planning is implemented I will have an exponentially better experience. That is the purpose of this paper: to outline my process to become a "world-class" engineer, from now to entering the work force. This project should function as a road-map to graduation. I will be able to look back at this in the years to come to compare where I am currently at to where I should be, as described in the paper. As nothing ever goes exactly as planned, this road-map can also be edited throughout my time at the University of Alaska Anchorage (UAA) to fit my desired paths.

Identify Interests

I realized my interests pertaining to engineering during my senior year in high school. During this time I was enrolled in Advanced Placement (AP) Chemistry and AP Biology. These were some of my favorite classes and they made it obvious that I wanted to be involved in a science related field. Conceptual science was interesting enough but what I found fascinating was applied science. Although I enjoyed many other subjects, such as music, I decided to focus on science for my future. This was because graduating with a bachelor's in science, and specifically engineering, offered these benefits ranked in order of importance to me:

1. Career security
2. Good paycheck
3. Engineering career diversity (many different fields of engineering)
4. General career diversity (could find a career in places other than engineering)
5. Science and math intensive coursework
6. Appearance on a resume
7. Speaks for dedication and commitment to a rigorous academic standard
8. Indicates a readiness for a technical job

Engineering holds a certain allure to me in particular due to some of my other interests. These include my love of technology, travel, and efficiency. Achieving a degree in engineering would allow me to work with the newest technologies available, which to me is not a job; it is fun. Engineers are needed everywhere in the world, from the biggest cities to the smallest

villages. This creates many opportunities for travel as an engineer, which is something I would love in a career. Part of being an engineer is making things more efficient, and, contemporarily, more clean. This holds huge interest to me, as it is my natural tendency to look around me and see how energy and waste could be used and disposed of or reused more wisely, making a career in engineering likely to be a very rewarding experience.

Identifying my interests was an important start for me in a journey to becoming a successful engineering student, which has only just begun. As compared to a "world-class" engineering student, I am where I need to be in this aspect. I have found and narrowed my interests to those that I want to base my future on.

Create Goals

Graduating with a degree in engineering is very important to me, as it is the gateway to a career that I desire. It is the most important goal in my life, but I need to constantly remind myself of this all-important goal as I struggle through the coursework by thinking of the end result; the job I would be able to get, the money I would be able to make, the financial stability I would then have, and the quality and style of life I could then provide for myself and any family I may have.

Creating goals gives life direction. Without this crucial step, my process to becoming a "world-class" engineer would be pointless. My trip through college would be directionless and most likely end in failure. That is why to be successful I must create goals early on and either stick with them or change them to better fit my desired course. But one thing must stay constant—the presence of goals themselves, long and short term. I currently am using these goals as my direction in college and feel on par in this aspect.

Strengthening My Commitment

Below is a list of my top perks of being an engineer:

- Job security
- Career diversity
- Financial stability
- Math and science related
- Could work anywhere
- Relationship to modern technology
- Ability to make a difference for people
- Ability to make a difference for the environment
- High chance of being hired
- Career progression

The monetary rewards are a very important part to my decision of a career. Engineering has one of the best starting salaries. I would like to be able maintain a certain lifestyle, and having the income that an average engineer makes would more than support the lifestyle of my choice. Engineers also have one of highest out of school hiring rates. Being able to start making money right out of school would allow me to pay off any possible debt and start saving money quickly. The field of engineering is ever growing, changing, and diversifying. It is also necessary to most areas of the world market. For these reasons, it is hard to imagine a lack of demand for engineers. This outstanding job security supports my decision to be an engineer, as I want my schooling and experience to be worthwhile and to last until retirement. A career in engineering has the salary, initial hiring rate, and job security that I am looking for.

Engineering is a very difficult major. Even though I have many reasons to motivate me to graduate with this degree, these rewards can be lost in the rigor and stress of the course load. A "world-class" engineer student would find ways to constantly remind himself of this. In order to make that next step in becoming "world-class," then, I should increase the times I think of the positive aspects of graduating as an engineer. One way to do this would be to post the above list of engineering perks at my desk. That way when I begin to feel overwhelmed, unmotivated, or stressed I can look at that list and see the reasons why I am putting myself through this tough major.

Clarification of Goals

I had the privilege of travelling to rural Alaskan communities last summer for work. During a trip to Atka (a small island in the Aleutians), I visited a nearly completed hydro project that included a dam. Seeing this project and hearing of its estimated energy production sparked my interests. Immediately my goals evolved from simply a degree in engineering to a degree in engineering specializing in energy, specifically hydro power. Environmental engineering was the section of engineering that was most closely related to my interests. At UAA, the civil engineering program is the one to be in for environmental engineering, resulting in me becoming enrolled in civil engineering.

I am where I need to be in clarifying my goals. Like me, a "world-class" engineer student would have a particular engineering program selected by the second year at the latest. Also this student would base his decision on what intrigues him, similar to how I came choose civil engineering.

Course "Road-Map"

It is important to create a class schedule leading to graduation. Utilizing a schedule will ensure that no extra time is taken to receive a degree. By doing so, it is ensured that all required classes are completed in a logical order. Also, in following my schedule found below, I will not be caught off guard by prerequisite or co-requisite courses. Additionally I will complete the classes in order so as not to have to tag on the ones I missed in an extra semester. This is an easy way to keep my semesters organized and a way to judge course load at a glance.

As compared to a "world-class" engineering student, I am not where I need to be. The following schedule only includes required courses for a civil engineering degree and does not include the electives that the university requires. This is due to my transfer from Montana State University. I have yet to submit requests for credit as required electives for several transfer credits, leaving me unsure as to which electives I will need to complete at UAA. I should have turned those in at the start of the semester. Needless to say, it should be done as soon as possible. After I learn which transfer courses I will receive credit for, I can finalize the schedule found following with the electives I will need to complete.

The following tables are my required courses for graduating, ordered by semester:

Year	2012, Fall	Credits	Year	2013, Spring	Credits
ENGR A151		1	ENGR A161		3
ES A103/A103L		3	ES A302		3
HNRS A292		3	MATH A202		4
MATH A201		4	PHYS A211/A211L		4
PHYS A130		3	CE 152		1
Total Credits		14	Total Credits		15

Year	2013, Fall	Credits	Year	2014, Spring	Credits
MATH A302		3	ES A331		3
ES A209		3	ES A210		3
GEO A155		3	ES A341/A341L		4
PHYS A212/A212L		4	CE A441		3
Total Credits		13	Total Credits		13

Year	2014, Fall	Credits	Year	2015, Spring	Credits
CE A334/A334L		3	CE A344		3
ESM A450		3	CE A405		3
			CE A435/A435L		3
			CE A431		4
Total Credits		6	Total Credits		13

Year	2015, Fall	Credits	Year	2016, Spring	Credits
CE A442		3	CE A433		3
CE A406		3	CE A438		3
CE A422		3	CE A403		3
CE A432		3			
CE A437		1			
Total Credits		13	Total Credits		9

Dealing with Adversity

The way I deal with adversity will make the difference between success and failure. It is inevitable that I will face difficulties, problems, and plans gone awry. Civil engineering showcases a rigorous series of courses. It is how I deal with these hardships that is important.

My current methods of dealing with adversity are not perfect. While in high school, everything came easy to me. College is quite different. Now I must work harder than I ever have at academics, which has led to some issues. The worst is giving up—I think very highly of my intellectual abilities, so when I have difficulty understanding a concept or an assignment is taking too long, my instinct is to drop it and do something else. This attitude must change for me to be successful.

To correct my trouble with giving up, I need to change my attitude. One strategy I should implement when I feel like giving up is to instead review the basic concepts leading up to the advanced topic. If that does not work, I should implement another strategy of using a different style of learning (such as creating visual representations of a written theory) to get an understanding through a more effective style for me. Following are examples of my current attitude and the two strategies.

Current attitude: "I don't understand this, so what's the point?"

Successful attitude: "I don't understand this, so I need to spend more time learning the material."

Successful attitude: "I don't understand this, so I need to try different strategies that suit my learning style."

Procrastination

Procrastination is an issue that everyone has encountered. The real trouble begins when procrastination becomes habit. Landis identifies four reasons of procrastination:

1. Fear of failure
2. Fear of success
3. Low tolerance for unpleasant tasks
4. Disorganized [Landis 176-177]

I have used all four of these reasons as an excuse for procrastination. To negate the consequences of procrastination, I must be able to recognize which reason I am using to procrastinate and react accordingly. Below is a table of describing reason, indication, and positive response for when I procrastinate.

Reason	Indications	Positive Response
Fear of Failure	Feelings of fear for an upcoming assignment	Work easier problems first and work my way to the harder problems, building off of successes
Fear of Success	Feelings of fear towards expectations should I do well	Change in attitude from desire to meet others' expectations to my own expectations
Low Tolerance for Unpleasant Tasks	Lack of motivation or desire to complete a task	Create a reward system where completing a portion of the task results in allowing myself to take a timed break
Disorganized	Not knowing when upcoming assignments are due	Put assignments on a calendar that I will use and look at frequently

Stress Management

After taking a stress response test, I noticed a disturbing trend in the results—all of the reactions to stress that I found make for an extremely hard time in completing homework assignments, studying, or doing chores that in the long run would make my life easier. While stressed, it may seem like being productive is an impossibility, but there are ways to cope with my stress and stress reactions.

One approach to handling these reactions is to consciously break my workload for the day into small pieces, so that the amount required of me can be seen realistically and to make it look less overwhelming. For example, I would first break my days work into categories based on what class it is for. From there I could further divide the work by question, paragraph, section, or other way depending on the subject matter. In this way, I can clearly see my progress and my successes at the smaller chunks could then be used as motivation.

Another way to deal with these stress reactions is to take limited breaks as a reward system. This means that after completing a certain amount of work, I will reward myself with a break from the work. This break will be timed, and the time nonnegotiable. In this way, completion of work will earn me the reward of a break, which will also serve to give my mind time to rejuvenate.

A third and more general method of coping with my stress reactions is to stay organized. Keeping my class work, due dates, and life organized will greatly reduce the amount of stress in my life, also reducing the severity of my stress reactions. Implementing these three strategies will help to cancel the negative effects of my stress reactions.

Peer Relationships

I have taken multiple personality tests, and they all indicate that I am an introvert. This causes the creation of peer relationships a difficult objective. A “world-class” engineering student would have multiple contacts in every class. This would allow him to get peer assistance, form work groups, and make new friends in his classes. I have a long ways to go, but a good starting place would be to find one contact (name and email/phone number) for each of my classes.

Time Management

Time management is one of my weakest areas. It is also an objective that is easily changed. The simple use of a daily planner could solve practically all of my time management issues. The difficult part is not obtaining a planner but implementing it into my every-day life. The trick is to make the use of a planner a habit, which in turn requires dedication to write everything down in this planner until it is forced into habit. I must begin using a planner by no later than the start of next semester (Spring 2013).

Co-Curricular Activities

I am not currently involved in any co-curricular activities. The reasons behind this are time based, as I cannot fit any clubs into my current schedule. In the following semesters, I should set aside time to join and participate in an engineering club. The benefits of being a club member are vast. These benefits include peer connections, faculty connections, possible scholarships, experience working with a group of engineers, meeting professional engineers, employment opportunities, and more. Because I do not want to miss out on all of these perks, I should join an engineering club next semester.

The UAA System

The UAA system includes online resources, support networks, and library. A "world-class" engineering student would take advantage of all of these valuable commodities. Personally, I use very few of them. To become a more successful student, I should begin to use these resources. To start off with, I should go to the "Math Lab" to work on calculus homework. It is a good environment to study, even if I do not have specific questions for the tutors. Additionally I should bring papers (such as this one) to the "Writing Lab" to get helpful feedback and to improve my writing skills. Finally, the library has countless uses that I need to use more often.

Work Experience

I already have an engineering related internship with the State of Alaska, Department of Environmental Conservation, Solid Waste Program. During the summers I will be travelling to rural Alaska to conduct analyses of environmentally concerning sites, and evaluating them based

on impending erosion and probable danger should the site erode. While classes are in progress, I work at the office preparing for the next travel season and inputting data that has been gathered into a database.

Summary

I will strive to follow my process to becoming a "world-class" engineering student in the years to come. It is reassuring to see that I have already reached my desired level in some objectives of my process. On the contrary, other aspects are in incredibly poor shape.

Completed Objectives-

I have identified my interests in science and have found that many of my other interests also point to a degree in engineering. I have, then, made it my goal to graduate with a degree in engineering from UAA. I strengthened my commitment to this goal by realizing the many benefits of graduating with a degree in engineering and in holding an engineering career. I clarified my goal of graduating with a degree in engineering to a degree in civil engineering. I created a course schedule for my required classes needed to graduate. I have been employed in an engineering related internship.

Objectives In Progress-

I must be constantly aware of adversity, and when faced with it I must deal with it appropriately. Similarly, I need to implement strategies to counter my procrastination issues. I must manage stress in a healthy way.

High Priority Objectives-

It is imperative that I create new peer connections. It is imperative that I manage my time with a planner. It is imperative that I become involved in an engineering club. It is imperative that utilize the system offered at UAA.

References

Landis, Raymond B., "Studying Engineering: A Road Map to a Rewarding Career", 3rd Edition, Discovery Press, Los Angeles, California, 2007