Udacity Data Analyst Nanodegree (DAND) Review

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I may seem like a strange student for one of Udacity’s courses. I am currently enrolled as a double major in aerospace and mechanical engineering at Case Western Reserve University where I have one year remaining. I am not actively looking to switch to data analysis, but wanted to augment my skills and ensure that I at least have some experience in this field that will only grow in import as the amount of data collected in every field continues to increase.

**My Background**

Udacity states that this is an intermediate program and “entering students should have programming experience (preferably Python), and ideally some background in descriptive and inferential statistics.” That described me pretty well at the outset. I had no formal training in Python but had picked some up on my own and felt relatively comfortable with the basic programming structure and the syntax of Python. I also had never taken an explicit statistics course, but had used statistical methods for numerous classes. I began this program while on an internship at NASA as I way to spend my weekends and evenings and any slow moments at work (there were a lot of times I was able to “work” on this class while on the job). I would say that Udacity’s assessment of where you should be before starting this course is spot on, and at least a minimal level of programming and statistics would be recommended. It would be possible to finish this degree with no experience whatsoever, but it would take a lot of self-teaching and augmentation of the course with other resources (perhaps other Udacity courses). If you are self-motivated, then nothing in this program should be that great of a challenge, and even for those with extensive experience, there will be a lot of time spent exploring the Udacity forums or Stack Overflow.

**Time and Cost**

Before I even talk about the content of the course, I will address the two questions I inevitably receive whenever I bring up the nanodegree program: “How long does it take?”, and “What does it cost?” In answer to the first question, Udacity estimates that students typically take around 260 hours to complete the course. I am not sure where that figure comes from and whether it includes both time spent watching lessons and working on the projects, but it seems a reasonable figure. At the minimum advised 5 working hours/week, that would take 52 weeks, or exactly 1 year to complete the course. I spent a total of 315 hours on the nanodegree over the course of 2 months. Like I said, I mostly worked evenings and weekends, and averaged about 35 hours per week over the course of the degree. Of that time, 101 hours was spent on projects, and 214 hours were spent on the lessons/problem sets. Two months might be pushing it for most students, but it is manageable with a large commitment.

In terms of cost, my answer always starts out: “Well, the answer could be free.” All course materials and even project materials can be accessed for free! However, in order to have your projects reviewed and receive an official graduation certificate, you’ll have to pay. In my case, I choose the basic level of enrollment at $200 per month. There is also the option of the nanodegree plus, which runs $300/month but offers a job guarantee in the field within 6 months of completing the course or your money back (subject to [terms and conditions](https://www.udacity.com/legal/nanodegreeplus), including submitting at least 5 applications per week). Both levels of enrollment offer a 50% refund on tuition if the program is completed within 12 months. That means I paid a total of $200 for over 200 hours of instruction. At my university, an average semester-long class will involve about 100 hours of instruction and costs $1900/credit hour resulting in a cost of $57 per hour of instruction. I am not claiming that the Udacity lessons are the exact equivalent of a college course, and they are videos rather than in person teaching, but even so, at 1/50 the cost, I am more than pleased at the value of this degree.

**Overall Impression**

I will get into the details of each project further on, but for those looking for my final takeaway, I would say that I fully recommend this course. The quality of all aspects of the course surpassed any expectations I held, and after this experience, I will be enrolling in my next course as soon as possible. I have always been excited at the prospect of learning new skills, and the first day of a college course has long been my favorite moments when I look at the syllabus and see everything that I will be able to find out about. However, by the end of the semester, this initial eagerness has faded into the maelstrom of stress and frustration that arises around any exams. Moreover, I often finish a course only to realize that I know nothing about how to apply anything I’ve just spent the past four months learning. Sure, I can recite the relevant facts, and perform adequately on the tests specifically designed to align with the material, but I have no idea how I could take what I learned and do something useful with it. Udacity has figured out how to solve this problem, and that solution, not surprisingly, is projects. Every section of the Udacity course is followed up by an in-depth project that usually involved real-world data (or allowed students to find their own dataset) and required me to apply nearly everything I had learned in the instructional videos. These projects are no simple fill-in-the-blanks exercises either. The level of involvement varies, and some of them (including the machine learning project) are fairly structured, but even so, countless times I found myself digging through Stack Overflow posts and skipping meals to work on the projects because they were so engaging and I wanted to do my absolute best. I remained almost 100% engaged throughout the entire course (there were a few slower spots at the beginning of some of the lessons) and did not find myself with the usual subject fatigue that I often develop at the end of college courses where I just want to be done and never have to look at the material again. Even after finishing a lesson, I would find myself reading blog posts or digging into some application of the material I had found online. Rather than make me sick at the subject, the Udacity lessons made me genuinely curious about the topics, which feeds back into a virtuous learning cycle where I spend nearly all of my free time exploring more and more of the world that this course opens up into data analysis.

For me, the entire strength of the Udacity DAND program is the application based philosophy of the course. If you are looking for the theoretical underpinnings of data analysis and visualization, then perhaps this is not the right course for you. If however, you want to get your hands dirty and work on projects that reflect what data analysts actually do in the real world, then sign up as soon as possible. All of Udacity’s courses are developed with industry partners, and this course is a partnership between Udacity, Facebook, and Tableau (a maker of a [great data visualization tool](https://www.tableau.com/products/desktop) that gives you no reason to ever make an Excel chart again). Therefore, the focus of the class is on developing skills that will actually be put to use as opposed to learning about the principles of the field. There is conceptual material ([Edward Tufte's](https://en.wikipedia.org/wiki/Edward_Tufte) work and ideas make several appearances) that makes its way into the course, but it is always reinforce with a real-world application and usually several quiz questions. I have often struggled with the question of whether or not it is important to understand the theory of a concept or if it is enough to know how to use the tools in a field. Udacity certainly falls on the tool-usage side of that line and I thoroughly enjoyed this approach. There was no talk of abstract concepts that often lose students (although there were numerous links for papers and articles for those wishing to dig into the theory) but merely the presentation and explanation of the actual tools in use today and how they are best used.