Occupational Profile Project:

Mechanical Engineering and Mechanical Engineering Technology

Curtis Kula

Ivy Tech English 111-1CC

Occupational Profile Project:

Mechanical Engineering and Mechanical Engineering Technology

 Many students who are just entering college are still wondering what they would like to do once they have graduated and obtained their degree. Looking at myself on the other hand, I am about to graduate and I know what I would like to do with my degree. I am currently enrolled in the engineering technology program here at Ivy Tech. After I receive my degree I would like to obtain a job in the engineering or engineering technology field. There are many different fields available in engineering and engineering technology whether it be civil engineering, aerospace engineering, or industrial engineering. I however would like to find a job in the mechanical engineering (ME) or mechanical engineering technology (MET). Both areas ME and MET are almost exactly the same with the only differences being pay rate and schooling. Therefore I will talk about the mechanical engineering field but also point out and describe the differences.

 Mechanical engineering by definition is a type of engineering dealing with the use of machines in industry (Merriam-Webster). According to the bureau of labor statistics, "Mechanical engineering is one of the broadest engineering disciplines. Mechanical engineers design, develop, build, and test mechanical and thermal devices, including tools, engines, and machines." ((4) U.S. Bureau of Labor Statistics, 2013) What this basically means is that mechanical engineers are one of the most important people behind, making things like machines work better or improving the way things are made. Mechanical engineers study a lot of theory and learn more in depth the physics and calculus involved. Mechanical engineers have a favorable work environment. They mostly work in an office setting but can go out to the field. Most of the time when a mechanical engineer goes out into the field it is to observe what problems are happening to certain machinery. They then go back to the office and find a way to improve the machinery or conditions that the machinery is being operated. To make things simple you could say that a mechanical engineer is a very educated problem solver. Throughout history mechanical engineers and the field of mechanical engineering has giving society countless improvements to machinery and everyday life. Some of the most interesting improvements include the cable cars in San Francisco, the Port Washington Power Plant in Milwaukee, and the Holt Caterpillar Tractor in Stockton, California ("List of Historic Mechanical Engineering Landmarks - Wikipedia, the free encyclopedia",2013).

 Mechanical engineering technology or a mechanical engineering technician is very similar to being a mechanical engineer. According to the bureau of labor statistics, "Mechanical engineering technicians help mechanical engineers design, develop, test, and manufacture mechanical devices, including tools, engines, and machines. They may make sketches and rough layouts, record and analyze data, make calculations and estimates, and report their findings." ((2) U.S. Bureau of Labor Statistics, 2014). Mechanical engineering technicians learn the same things but they are more of the hands on approach type. MET's know some of the theory that is involved in engineering, but they also know how to test machines and tools in real world situations. Mechanical engineers on the other hand are mostly theory guys. This means that mechanical engineers can see it on paper and can say yes or no it will work but they are not very good at making changes on the fly. Mechanical engineer technicians can see it on paper and might be able to say that it will or will not work. But once they test it in a real working environment they set themselves apart for the mechanical engineers. If the machine or tool fails or needs adjustments MET's have the knowledge and skills to get their hands dirty and fix the problems on the spot, instead of going back to the drawing board.

 If you are seeking to work in the mechanical engineering technology field, you only need to attend two years of schooling and receive a associates of science degree. MET's with an AS degree are known in the industry as an engineering technician. After you graduate with your AS degree in mechanical engineering technology you have two options. You can decide to continue your schooling and work your way to a BS in mechanical engineering technology, or you can decide to go straight into the work force and put your degree to work. If a BS degree is obtained this person is known in the industry as an engineering technologist.

 If you choose the mechanical engineering degree you will need to complete four years of schooling and receive a bachelors of science degree. These four years of college can be completed at a four year school like Purdue or, split between a two year and four year school. An example of splitting between a two and four year school would be starting at Ivy Tech in the pre engineering program then continuing at Purdue or IPFW. After receiving the degree in ME you have to decide if you want to work in the private sector or public sector. If you choose the private sector you may join the work force immediately. If you choose to work with the public on the hand must obtain licensing. This licensing process consists of three parts. The first part is passing an entrance exam know as the Fundamentals of Engineering exam to show that you know the field. The second part of the process is obtaining a job that utilizes what you know and makes you show that you can do the job. The final step is to take the final exam known as the Principles and Practice of Engineering exam. After all three steps have been completed you are a licensed mechanical engineer. The license works much like a drivers license. For instance if you receive you license in one state like Indiana other states will recognize and honor it.

 Once you have decided on which path to take, whether it be a ME or a MET and have completed the required, it is time to start thinking about obtaining a job and start getting paid for your efforts though-out school. According to the Bureau of Labor Statistics both mechanical engineers and mechanical engineering technicians have a projected growth of 5% ((4) U.S. Bureau of Labor Statistics, 2013). This amount is not really good compared against all other occupations. But when compared against each other mechanical engineers have a better outlook than engineering technicians. This is because there are significantly more engineers than technicians. In the year 2012 there was over 250,000 people employed as mechanical engineers ((4) U.S. Bureau of Labor Statistics, 2013). With the projected 5% growth over the next ten years means that approximately 11,000 new jobs will be added ((4) U.S. Bureau of Labor Statistics, 2013).

 If we look at employment numbers from 2012 for mechanical engineering technicians we see that there was only about 47,000 people employed in this field ((2) U.S. Bureau of Labor Statistics, 2014). After applying the expected growth of 5% we see that engineering technician will only gain about 2,000 new jobs ((2) U.S. Bureau of Labor Statistics, 2014). This however does not mean that engineers will have an easier time finding jobs, and some of their jobs will be taken by engineering technicians. The main reason this can happen is because engineering technicians are better equipped to handle the changes in technology. This falls back to what was learn during their schooling. Engineering technicians are taught more in the ways of modern technology and industry. Whereas engineers are the ones who learned more from the theory and fundamentals of engineering. Engineers can adapt to current industry but it takes a brief relearning period.

 Now we move on to the part that everyone likes, talking about money and what engineers and engineering technicians can expect to earn. Mechanical engineers for the most part make more than mechanical engineering technicians. I believe this is because of the knowledge that they received in school. According to the numbers from May of 2012 the average pay for a mechanical engineer in the United States was about $80,000 ((4) U.S. Bureau of Labor Statistics, 2013). The bottom 10% of earners for mechanical engineers earned about $52,000 ((4) U.S. Bureau of Labor Statistics, 2013). On the other hand the top 10% of earners for ME's made over $121,000 ((4) U.S. Bureau of Labor Statistics, 2013). The average pay for a mechanical engineer here in Indiana is about $74,000 and in the Fort Wayne area it drops to around $68,000 ((3) U.S. Bureau of Labor Statistics, 2014). These numbers show that mechanical engineers from Indiana or more specifically Fort Wayne earn less than the national average.

 Now let's see how the pay of mechanical engineering technicians compares. In the same month of 2012 MET's nationwide earned on average about $51,000 ((2) U.S. Bureau of Labor Statistics, 2014). As you can see this is far less than the nation average for ME's. The bottom 10% of earners for MET's earned less than $33,000 and the top 10% of earners made over $76,000 ((2) U.S. Bureau of Labor Statistics, 2014). If we look to the state of Indiana mechanical engineering technicians on average made about $51,000 ((1) U.S. Bureau of Labor Statistics , 2013). If we look closer to home at the Fort Wayne area MET's earned an average of about $55,000 ((1) U.S. Bureau of Labor Statistics , 2013). As you can see engineering technicians located in our state of Indiana earn about the same average pay as the national average. Now our local area of Fort Wayne engineering technicians average pay beats the national average by a couple thousand dollars per year.

 As you can see there are many difference between obtaining a career as either a mechanical engineer or mechanical engineering technician. The engineers usually go through more schooling but get rewarded with a higher pay. Technicians on the other hand take less schooling but they get to try and make up the difference in pay grade by joining the work force sooner than the engineers. Mechanical engineering technicians do have some what of the upper hand. They may not know as much of the theory side or the fundamentals behind the process but they know enough to combine it with are their knowledge of current industry practices. That added with their ability to better to adapting to new processes and technology can actually make them more valuable. Because of these traits it is not uncommon to find engineering technicians holding jobs as engineers.

 Before starting this paper I was pretty sure that I wanted to be an MET guy. I had taken classes before in engineering and I did not enjoy them. It was teaching all the theory as I stated multiple times throughout this paper. I learn better with a hands on approach rather than a theoretical approach. I would rather get my hands dirty and actually seeing the work happening for real instead of sitting in an office telling people well this should work because in theory it does. Yeah sure the money that mechanical engineers earn is more but money is not everything if you are not happy making it. However I am confident in my skill set that I know I can be one of the MET guys that beats out and ME guy in their own field. So after all my research I have definitely decided to stay an MET guy, good thing since I'm graduating in May.

References

American Society of Mechanical Engineering (n.d.). *Mechanical Engineering vs. Mechanical Engineering Technology: General Overview*. Retrieved February 21, 2014, from http://nhgs.tec.va.us/~jbridges/GAITE%20ES/Workshop%20Handouts%2011.15.08.pdf

*List of Historic Mechanical Engineering Landmarks - Wikipedia, the free encyclopedia*. (2013). Retrieved February 18, 2014, from http://en.wikipedia.org/wiki/List\_of\_Historic\_Mechanical\_Engineering\_Landmarks

Merriam-Webster (n.d.). *Mechanical engineering - Definition and More from the Free Merriam-Webster Dictionary*. Retrieved February 24, 2014, from http://www.merriam-webster.com/dictionary/mechanical%20engineering

School Soup (n.d.). *Mechanical engineers career information*. Retrieved February 21, 2014, from http://www.schoolsoup.com/careers/career\_info.php?career\_id=29

(1) U.S. Bureau of Labor Statistics (2013, March 29). *Occupational employment and wages, May 2012: Mechanical Engineering Technicians*. Retrieved February 20, 2014, from http://www.bls.gov/oes/current/oes173027.htm

(2) U.S. Bureau of Labor Statistics (2014, January 8). *Mechanical Engineering Technicians: occupational outlook handbook*. Retrieved February 21, 2014, from http://www.bls.gov/ooh/architecture-and-engineering/mechanical-engineering-technicians.htm

(3) U.S. Bureau of Labor Statistics (2014, January 8). *Mechanical Engineers : Occupational outlook handbook*. Retrieved February 21, 2014, from http://www.bls.gov/ooh/architecture-and-engineering/mechanical-engineers.htm

(4) U.S. Bureau of Labor Statistics (2013, March 23). *Occupational employment and wages, May 2012: Mechanical engineers*. Retrieved February 22, 2014, from http://www.bls.gov/oes/current/oes172141.htm

Willet, W. (2009, September 10). *ME vs MET: is the full mechanical engineering degree worth the extra $$?* Retrieved February 21, 2014, from http://www.examiner.com/article/me-vs-met-is-the-full-mechanical-engineering-degree-worth-the-extra