New Laptops for Engineering Majors
A Comparison of Three Different Engineering Laptops

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Summary
As an engineering major at Stephen F. Austin State University, I am proposing that the science department acquire new laptops for all engineering classes. This report evaluates three different laptops, the Lenovo ThinkPad W541, the Dell Precision M3800, and the HP ZBook 15. To evaluate the three laptops, I compared them on a rating scale of 1-5 that I made myself. I rated their cost, storage, processor, battery life, size, and other additional specs. The HP ZBook 15 scored the highest composite score of the three laptops. After my research, I recommend that the science department purchase 40 HP ZBook 15’s before the 2016 fall semester.

The Need for New Laptops
This report will recommend the best fitted laptop to be purchased for all engineering classes at Stephen F. Austin State University. As an engineering major at SFA, I have personally used the laptops that the science department currently issues to each engineering class. The current laptops are outdated, bulky, and in rough condition. The new laptops would be able to run much more efficiently, making it easier on the students as well as the professors. The students could also run many more engineering programs on the new laptops making for a better learning environment. The purchasing of new laptops would not only be a wise investment for the engineering students, but for the SFA engineering program itself.

Criteria
After meeting with other students pursuing a career in engineering at SFA, I have created a list of requirements and features to compare the three laptops. These requirements and features are listed in order of importance according to my engineering peers. I decided to rate each category from 1-5, 1 being the worst and 5 being the best. I then used the overall score of the categories for each laptop to determine the best suitable laptop for the science department to purchase.

- **Size:** The laptop must have no smaller than a 15 inch screen, and weigh no more than 7 pounds.
- **Battery Life:** The laptop must run for at least 2 hours consecutively due to classes having an hour long lab following the lecture.
- **Cost:** The budget for purchasing the new laptops should be around $2,500 for each laptop.
- **Storage:** The laptop must have a minimum of 256GB storage capacity.
- **Processor:** The laptop must have the most recent Intel core i7 processor.
- **Other:** Other features that would influence our choice. My peers recommended that it have a numeric key pad and a 4K quality screen.

The Contestants
There are three current models out in consideration for the engineering classes: The Lenovo ThinkPad W541, the Dell Precision M3800, and the HP ZBook 15. These all have come out within the last year and have all of the bare minimum requirements to be considered for purchase.
The Lenovo ThinkPad W541

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The Lenovo ThinkPad W541 is the latest model of the W-series from Lenovo. It has a few slightly new changes from the W540. I personally went to a tech shop and took some time to review and test the W541, to make my evaluations about the laptop. All specific data and information not sourced come from the Lenovo website.

**Size:**
The Lenovo ThinkPad W541 fits all the minimum size requirements. At 15 inches, it has the smallest screen of the three. Weighing in at 5.57 pounds, it is the second heaviest making in acceptable.

**Battery Life:**
The W541 has a standard 6-cell battery that can last up to 6 hours, which is well over the 2 hour requirement. The 99-Wh battery is rechargeable, and includes an AC adapter upon purchase of the laptop.

**Cost:**
The W541 is a little over budget at $2,770, but it has some additional features to stay in the running for consideration.

**Storage:**
Lenovo equips the W541 with a Solid State Drive and a generous capacity of 512GB (Winkler, 2015). It is well over the storage requirement needed for consideration, making it a viable option.

**Processor:**
The processor was not very convincing according to a review blog evaluating the Intel core i7-4940MQ processor (Winkler, 2015). The processor is not as fast as the other two laptops, which knocks it down a peg in the scoring. The purpose of getting new laptops is for faster more efficient processors, so the Lenovo would cause issues.
Other:
Although the Lenovo ThinkPad has some disadvantages, it has a few features to try and convince me. It has a numeric keypad on the right side of the keyboard, making it easier and faster to input numbers or data during class. It is also very well built in saying that it is very durable and could take a little beating. That is very important due to the fact that these laptops will be passed around from class to class.

The Dell Precision M3800

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The Dell Precision M3800 is Dell’s latest most modern equipped laptop that they have put on the market. According to a recent blog review about the M3800, it is a superb excellent notebook with a couple let downs (Vogel, 2015). While at the tech shop, I also did a little test run on the M3800 to get a better evaluation on it rather than just researching online. All specific data and information not sourced come from the Dell website.

Size:
The Dell Precision M3800 surpassed the screen size requirements with a 15.6 inch 4K resolution screen. It weighs in at 4.14 pounds making it the lightest of the three laptops in consideration. The size of the M3800 makes it a very considerable option.

Battery Life:
The M3800 is questionable on whether it would meet the 2 hour requirement for back-to-back classes. The expected battery life of the 6-cell 61-Wh battery was approximated at 3.6 hours to 1.2 hours depending what the system is doing (Vogel, 2015). Due to this fact, it is unpredictable whether or not it would last the full 2 hours. The battery life of the M3800 could create major problems.

Cost:
The cost of the Dell Precision M3800 is actually under budget at $2,284, which would leave some extra room to buy computer cases or extra AC adapters. The AC adapters are included, but it is never a bad idea to have a few extra.
**Storage:**
The standard M3800 comes with a 256GB capacity drive, making it the smallest storage of the 3 choices. Even though it does fit the requirement, it will get a lower score in this particular category compared to the other two laptops.

**Processor:**
The Dell Precision M3800 comes standard with an Intel core i7-4712HQ processor, making it pretty fast and reliable. It will be able to run all of the modern more advanced programs for engineering classes.

**Other:**
The only additional feature that really makes the M3800 stand out from the pack is its’ 4K Ultra HD quality screen. The clarity and eye popping detail of the M3800 is absolutely impeccable.

One key con to take into consideration is the fact that the Dell Precision M3800 does not have a numeric keypad on the keyboard. This could potentially be a major issue with engineering students.

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### The HP ZBook 15

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The HP ZBook 15 is a very great laptop for graphing and running advanced programs. HP just recently put the ZBook on the market, so it is equipped with advanced technology. This laptop in particular is owned by my friend. Due to this fact I got to test it over a week time period, and evaluated it very well. All specific data and information not sourced come from the HP website.

**Size:**
The HP ZBook 15 slides into our size requirements with its 6.2 pounds and 15.6 inch screen. It’s a big bruiser of a notebook, meant to pack the power of a desktop in a slightly more portable form (Westover, 2013).
**Battery Life:**
The ZBook is well equipped to withstand the 2 hour requirement on battery life. The battery life on the ZBook last up to 5 and half hours while being fully used. An AC adapter is included when you buy the laptop. The only downside to the ZBook’s battery is the fact that it is not removable.

**Cost:**
The cost of the HP ZBook is right on budget at $2,586, making it a very reasonable option for purchase.

**Storage:**
According to a review blog about the ZBook, it came outfitted with a 500GB hard drive, which offers plenty of space for documents and files, but if more space is needed, a 750GB option is available (Westover, 2013). Due to this fact, the HP ZBook offers the best storage options of the three laptops.

**Processor:**
The HP ZBook 15 comes standard with the Intel core i7-4800MQ processor. This processor has been tested to work for software specifically made for engineering, design, and digital content creation (Westover, 2013). The ZBook processor is perfect for what the engineering classes would need and want out of a laptop.

**Other:**
The HP ZBook 15 is the only laptop of the three that has a removable battery. This makes it so you can change it out with a spare if the computer was ever to die in the middle of use. It also comes standard with a numeric keypad on the keyboard. The ZBook’s 4K quality just adds to the influence of it being the right choice.

**Evaluation**
At this point in the research, all three of the laptops would cover all of the requirements for the job. Even though all three of them would work, the HP ZBook 15 is the better fit. The fact that its’ processor is specifically made for engineering software really influences the final decision. The battery life will be perfect for back-to-back lectures and labs, plus the laptop is very durable. The ZBook just happens to be right on the budget, and has the perfect amount of storage. For the money and best fit, the HP ZBook 15 is the perfect fit.

The table below summarizes the composite score for each laptop and the six categories. The HP ZBook 15 just barely finishes on top of the competition.
### Score Rating Table with All Six Categories

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### Recommendation

After researching and comparing the three best options, I recommend the science department purchase HP ZBook 15’s for the engineering classes. According to Extreme Tech blog, having made its reputation selling to engineers, HP is a natural when it comes to shopping for a portable laptop (Cardinal, 2015).

### References


