

**ECE571: Advanced Microprocessor Design – Homework 8**  
Fall 2019

**Due: Thursday 7 November 2019, 2:00pm**

Create a document that contains the answers to the questions below. A .pdf or .txt file is preferred but I can accept MS Office or Libreoffice format if necessary.

1. Read the following article:

- **A Validation of DRAM RAPL Power Measurements**

by Desrochers, Paradis and Weaver

[http://web.eece.maine.edu/~vweaver/projects/rapl/2016\\_memsys\\_rapl.pdf](http://web.eece.maine.edu/~vweaver/projects/rapl/2016_memsys_rapl.pdf)  
(warning, it's a large 13MB download, large graphs)

- Answer the following questions:

- (a) What kind of sensor was using for measuring actual DRAM power?
- (b) What tool was used to measure RAPL results?
- (c) Did the actual results match the DRAM results?
- (d) Why is it harder to measure DDR4 power than DDR3 power?
- (e) What additional experiments do you think could be run that would make this paper better?

2. If you have extra time, also Read the paper *Power Measurement Techniques on Standard Compute Nodes: A Quantitative Comparison* by Hackenberg, Ilsche, Schöne, Molka, Schmidt and Nagel (ISPASS 2013).

[http://web.eece.maine.edu/~vweaver/classes/ece571\\_2014f/papers/ispass2013-power\\_measurement.pdf](http://web.eece.maine.edu/~vweaver/classes/ece571_2014f/papers/ispass2013-power_measurement.pdf)

3. Submitting your work.

- Create the document containing the answers to the questions asked.
- Please make sure your name appears in the document.
- e-mail the file to me by the homework deadline.