

Name : _____

Class Number: _____

ENGR 11: Laboratory 2

Learn More About Scientific Computing

Some of my main goals as your teacher include:

Learning Goal 1: Help you understand the term scientific computation

Learning Goal 2: Help you discover why this class is required for some STEM majors.

Learning Goal 3: Inspire you to find reasons why scientific computation matters in your life

Learning Goal 4: Encourage you to plan future coursework and professional development to become the most competent programmer you can be

In order to accomplish these goals, I need to help you get a sense of what the field of scientific computation is and how this field fits into science. These five articles that you read in Lab 3 are designed to begin your introduction. More specifically, by the end of these five articles, I hope you can do each of the following:

- Define the three pillars of science: theory, experimentation, and computation.
- Describe the similarities and differences between the two versus three pillars of science.
- Make well-reasoned argument of your own about the two versus three pillars of science.
- Describe at least three reasons why writing good code is important in science.
- List at least three negative consequences of writing bad code.
- Describe at least three separate safe software practices you'd like to learn more about.

To finish this Lab 2, I ask you to complete each of the following:

- 1. Read each of the following five articles slowly and deeply:
 - A. *What kind of science is Computational Science?* by Rhett Allain
 - B. *What kind of science is Computational Science? A Rebuttal.* by Tamara Kolda
 - C. *Science has only two legs.* by Moshe Y. Vardi
 - D. *Error: why scientific programming does not compute* by Zeeya Merali
 - E. *Best Practices for Scientific Computing* by Greg Wilson et. al.

-
2. Plan to spend 90 - 180 minutes reading these five articles.

You may need more time. However, if you finish faster than this, I challenge you to slow down and read more carefully. There is a lot of information in these articles and probably a bunch of new words/phrases that you've never seen.

-
3. Fill out questions 1 - 18 on pages 1 - 12 of the [ENGR 11 Lab 2 Reading Worksheet](#)
- A. Type your responses in the docx document posed on our homepage.
- B. Submit your responses with your Lab 2 report

Note: In total, I spent about 10 hours researching, reading, and thinking about these articles. I do NOT expect you to spend this amount of time. However, please know that I have read every word of each of these documents. I also found .pdf copies of many of the references listed in each of these documents. Finally, I created an [Amazon.com wishlist of all the Scientific Computation books](#) I plan to buy to help me be a better teacher in this class. I share a copy of a screenshot of this wish list online. If you are interested in developing a specialty in scientific computation as part of your educational journey, perhaps you might think about purchasing some of these for your own personal library.