**Blue Waters Petascale Semester Curriculum v1.0**

**Unit 3: Using a Cluster**

**Lesson 1: Parallel Architecture 1**

**Instructor Guide**

*Developed by Peter J. Hawrylak for the Shodor Education Foundation, Inc.*



*Except where otherwise noted, this work by The Shodor Education Foundation, Inc. is licensed under CC BY-NC 4.0. To view a copy of this license, visit*[*https://creativecommons.org/licenses/by-nc/4.0*](https://creativecommons.org/licenses/by-nc/4.0)

*Browse and search the full curriculum at*[*http://shodor.org/petascale/materials/semester-curriculum*](http://shodor.org/petascale/materials/semester-curriculum)

*We welcome your improvements! You can submit your proposed changes to this material and the rest of the curriculum in our GitHub repository at*[*https://github.com/shodor-education/petascale-semester-curriculum*](https://github.com/shodor-education/petascale-semester-curriculum)

*We want to hear from you! Please let us know your experiences using this material by sending email to* [*petascale@shodor.org*](mailto:petascale@shodor.org)

No materials or other requirements are needed for this lesson.

The PowerPoint slides provide a basis for an introductory/overview lecture and the homework problems provide exercises for students to work either in-class or at home. The PowerPoint slides should cover the 20-25 minutes with the homework problems reinforcing and expanding on the material. The PowerPoint slides are in a very basic format to simplify customization to a desired background.

It is suggested to have the students work the homework problems on their own and then present solutions during class with a discussion period for each problem. The homework problems can be extended to increase difficulty or this can be used to help facilitate discussion during the in-class discussion of the problems.

**Common Pitfalls for Instructors and Students**

**Instructors:**

None

**Students:**

· Not looking at multiple options when applying Foster’s methodology.

· Not rechecking scalability as you apply each step of Foster’s methodology.

· Not understanding instruction level parallelism and multicore. If a problem please see two slides covering instruction level parallelism and multicore near beginning of the slide deck.