

March 30, 2015

San Francisco State Workshop

Overview of Computational Science Education Materials

XSEDE

Extreme Science and Engineering
Discovery Environment



Why Computational Science?

- How science and engineering is done
 - Models allow insights when systems are too large, too small, or too complex to fully understand through experimentation
 - Reduces time to solution for many types of research and design
 - Facilitates research that could not be done in any other way
- Now expanding to the use of digital resources in the humanities and social sciences

Computational Science Skills

- Computational science provides skills needed in the present and future workforce
 - Understanding of modeling techniques that are used in research and business
 - Data management skills
 - Analytical skills
 - Teamwork skills
 - Communications skills
- Inquiry-based education approach engages students in learning



Benefits to Students

- Inquiry-based learning is more effective than traditional lecture oriented instruction
 - Students are actively engaged in the learning process
 - Students gain deeper insights and have higher retention rates for the information
 - Facilitates the integration of information across academic disciplines – math, science, engineering, computer science, social science, and humanities

Goals for the Session

- Demonstrate the pedagogy for computational science education
- Progression of possible activities
 - Using complete models to demonstrate principles
 - Running models to gain insights into system behavior
 - Modifying models to relax assumptions
 - Building new models

What We Will Cover

- Introduce materials and models that can be incorporated for classroom use
- Introduce simple tools that can be used to build and demonstrate modeling techniques
- Provide example datasets and exercises
- Provide a list of resources you can explore in detail later




Getting Started

- Point your browser here:
- <https://www.osc.edu/~sgordon>
 - Choose **Workshop Materials**
 - Then **Links to other materials**

Session Evaluation

- <http://bit.ly/xsedesfsu>





Our reach will forever
exceed our grasp, but,
in stretching our horizon,
we forever improve our world.

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