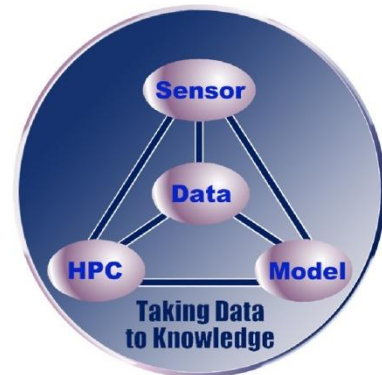
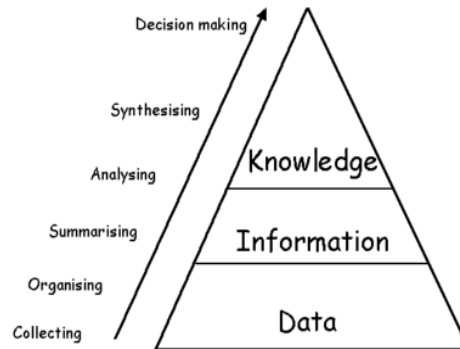
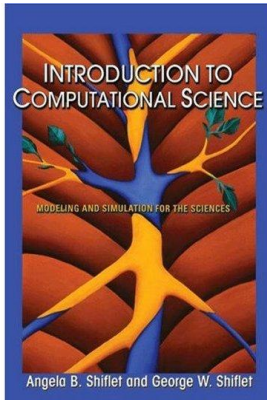


CDS 101: Introduction to Computational & Data Sciences



- **When:** Fall 2011, Tuesdays & Thursdays, 1:30-2:45pm
- **Where:** Research I, room 301
- **Class URL:** <http://classweb.gmu.edu/kborne/cds101/>
- **Instructor:** Kirk Borne @ <http://classweb.gmu.edu/kborne>
- **Course brief description:** This course explores the connections between the on-going advances across the natural sciences with the rapid advances in computing technologies. Students will learn about the cutting edge results in the Computational and Data Sciences, and develop a greater understanding of the methods and techniques that make these results possible. Examples familiar to students and from the frontiers of science will be presented to demonstrate how computational tools and databases are changing our scientific approach in domains from genetics to sustainability to cosmology. Students will learn how we use computers, social networking, and data mining to analyze large data sets and to create complex numerical simulations across the disciplines, seeing how the use of computers and databases are now a natural part of the scientific method. No mathematical background is assumed for students in the course, other than successful completion of the Math competency exam. Qualitative results will be emphasized, to illustrate the problems, algorithms, and challenges facing researchers today.
- **Course objectives:** to develop an understanding of the following: the scientific method in the modern age – how databases and computers are used to investigate scientific problems; how to solve simple science problems computationally using Excel; how data are acquired, analyzed, and visualized in a variety of scientific domains to answer scientific questions; how computational methods and computer-based simulations are used across the natural sciences to solve research problems; and what are the connections between advances in computing and databases with advances in the sciences.
- **Gen Ed:** this course satisfies Mason's Gen Ed Natural Science requirement.

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