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SCALE-IT



# Building Better Interdisciplinary Scientists

## Creating Graduate Level Courses to Address the Communication Gap in Interdisciplinary Research

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### Our Goals

- 1 • Train graduate students
- 2 • Produce novel research
- 3 • Create “biocomputational” scientists

### Our Challenges

- 1 • Vast Knowledge Gap
- 2 • No Prior Training
- 3 • No Interdisciplinary Courses

### Our Solution

Develop new graduate level course work aimed at training students in bioinformatics

### Our Impact

- 1 • Immediate Student Support
- 2 • Faculty Involvement
- 3 • Institutional Recognition

### Scripting and Data Analysis

#### COURSE GOALS

1. Learn how to think like a computer scientist
2. Use Perl for data analysis
3. Remove the fear of the terminal!

#### RECOMMENDED FOR

Graduate students with no coding background and a desire to do computational research in the sciences

### Fundamentals of C++ and HPC

#### COURSE GOALS

1. Learn object oriented programming with C++
2. Understand and code serial programs
3. Write a simple parallel program with threading

#### RECOMMENDED FOR

Graduate students with a limited understanding of coding who need to know a high level language

### Algorithm Design and C

#### COURSE GOALS

1. Use more complicated data structures and algorithms
2. Provide experience in performance analysis
3. Introduce memory management with C

#### RECOMMENDED FOR

Graduate students with a strong coding background and an understanding of C++ serial program design

### Biology for Computational Researchers

Ecology  
Biochemistry  
Evolution  
**Genetics**  
Phylogenetics  
Cell Signaling  
Cell Biology

#### UTK Faculty:

Dr. L. Hauser, Molecular	Dr. B. O'Meara, Phylogenetics
Dr. J. Baudry, Biochemistry	Dr. V. Ganusov, Immunology
Dr. J. Joo, Cell Signaling	Dr. P. Armsworth, Ecology

#### Corporate Demand:

**1 year paid internship for programmers to learn to hack biology**

Ginkgo BioWorks UNITED STATES

NEW COURSE SEQUENCE: PROGRAMING FOR SCIENTISTS