Introduction to Course

BCB 504: Applied Bioinformatics

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Course description and goals

Description A data driven approach for the computational and statistical understanding and expertise needed to solve bioinformatics problems that you will likely encounter in your research.

Goals Following this course the student will be capable of:

- performing their own data analysis project,
- understanding the technical and statistical tools needed to conduct that analysis
- have the computational ability to do the analysis
- critically review and implement techniques and methods in publications.

Course topics

DNA Microarrays Expression, ChIP-Chip, aCGH - 5 lectures

Phylogenetic Methods M. Pennell - 4 lectures

DNA/RNA sequencing - introductory lecture

- Sequence Assembly - 3 lectures
- Sequence Mapping - 3 lectures
- RNA-seq - 3 lectures
- Metagenomics - 3 lectures

GWAS Genomic Wide Association Studies (aka SNP Chips) - 4 lectures

Course format

Lectures PDF/Powerpoint style lectures going over the primary topics, analysis objectives, result expectations.

Workshop Applying the topics discussed in the lectures on a real dataset.

Paper discussion Discussion of methods based techniques within published papers.

Expected capabilities

- Navigate a Linux environment without trouble (i.e log in to CRC servers, move around directories, create directories, etc.)
- Run command line programs and manipulate arguments
- Basic familiarity with the R programming language.

Grading

Projects (72%) For each major section in the class there will be a project associated with it. Each project will be a report on the analysis of public data (or your own data) using the techniques discussed in class. The reports must be written using Latex with embedded R code of the complete analysis. A template will be provided.

Publication Reviews (28%) short 1/2 to full page comments on assigned methods papers.

Course webpage

http://www.webpages.uidaho.edu/msettles/courses/bcb504Sp12/index.ht