**UCD Summer 2025 Bioinformatics**
**Timetable: Monday 14 July – Friday 25 July**

GCC – Gavin Conant, North Carolina State University
GD – Gavin Douglas, North Carolina State University and University of New Brunswick, Fredericton

| Day | Lecturer | Time | Topic |
|---|---|---|---|
| Monday 14 | GCC | 9-9:45 | Intro, connection to VCL |
| | | 10-12 | DNA sequencing, FASTQ files and sequencing errors |
| | | 1:30-4:30 | Finish script, Assembly (Annotation) |
| Tuesday 15 | GCC | 9-10:30 | Homology, sequence alignment, BLAST |
| | | 10:30-12 | Orthologs, paralogs, gene duplication, measures of selective constraint |
| | | 1:30-4:30 | Phylogenetics, tree-thinking |
| Wednesday 16 | GCC | 9-10:30 | RNA-Seq: Read mapping, quantification |
| | | 10:30-12:00 | RNA-Seq: exploratory data analysis, differential gene expression |
| | | 1:30-2:30 | Multiple test corrections |
| | | 2:30:4:30 | Modeling metabolism |
| Thursday 17 | GCC | 9-10:30 | Flux-balance analysis |
| | | 10:30-12 | Databases |
| | | 1:30-3:00 | Computing, scripts, packages, compilers |
| | | 3:00-4:30 | Parallel computing |
| Friday 18 | GCC | 9:30-12 | Topics arising/Catchup OR Protein structure prediction |
| | GCC/GD | 1:30-4:30 | GCC: Genetic drift in python |

| Monday 21 | GD | 9:00-12:00 | R programming basics |
|---|---|---|---|
| | | 1:30-4:30 | Data analysis and visualization in R |
| Tuesday 22 | GD | 9:00-12:00 | R for genomic data |
| | | 1:30-4:30 | Variant discovery |
| Wednesday 23 | GD | 9:00-12:00 | Population structure |
| | | 1:30-4:30 | Genome-wide association studies |
| Thursday 24 | GD | 9:00-12:00 | Metagenomics |
| | | 1:30-4:30 | Biological networks |
| Friday 25 | GD | 9:00-12:00 | Q&A, working environment tips |
| | | Afternoon | EXAM (two hours) |