

## METAGENOMICS: FROM GENES TO ECOSYSTEMS (487/587)

Bonnie Hurwitz, PhD,  
Assistant Professor, Agricultural and Biosystems Engineering  
Fall 2016

### Topics Calendar

	<b>Tuesday</b>	<b>Thursday</b>
<b>8/23 &amp; 8/25</b>	Outline of the course	Getting started
<b>8/30 &amp; 9/1</b>	Introduction to environmental 'omics	Introduction to Github and the HPC
<b>9/6 &amp; 9/8</b>	Introduction to next-generation sequencing	Introduction to Unix
<b>9/13 &amp; 9/15</b>	Reference sequence databases; Seqtools hands-on	Why Perl 6?; "Hello world"
<b>9/20 &amp; 9/22</b>	Quality control; Fastqc and Trimmomatic hands-on	Perl program structure, statements, and variables
<b>9/27 &amp; 9/29</b>	Metagenomic assembly; Mega-hit hands-on	Perl operators, functions, and control structures
<b>10/4 &amp; 10/6</b>	Read recruitment and quantification; Bowtie hands-on	Perl I/O
<b>10/11 &amp; 10/13</b>	Gene finding; Prodigal hands-on	Perl arrays and lists
<b>10/18 &amp; 10/20</b>	Hidden Markov Models (HMM profiles) and searching for patterns; hmmersearch hands-on	Perl hashes
<b>10/25 &amp; 10/27</b>	Taxonomic Annotation; Centrifuge hands-on	Perl regular expressions
<b>11/1 &amp; 11/3</b>	Functional Annotation; Interproscan hands-on	Perl split and join
<b>11/8 &amp; 11/10</b>	Profiling contigs; Calculating coverage and detecting single nucleotide variations (SNVs)	Perl subroutines and avoiding scope errors
<b>11/15 &amp; 11/17</b>	Genomic binning; hierarchical clustering and CONCOCT hands-on	Perl modules and data structures
<b>11/22 &amp; 11/24</b>	Interactive visualization in Anvi'o	- Holiday -
<b>11/29 &amp; 12/1</b>	Journal-club presentations	Journal-club presentations
<b>12/6</b>	Course wrap-up	-Dead Day-