

MARS8180
Marine Ecological Genomics
2:00-3:15 pm, T,Th
Fall 2012

Contact Information:
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Grading Policy

Course grade will be based on: attendance and participation (15%), class web tool presentation (15%), preliminary project (15%) and final project (55%)

Academic Honesty

All academic work must meet the standards contained in “A Culture of Honesty.” Students are responsible for informing themselves about those standards before performing any academic work.

Course Syllabus

The course syllabus that follows is a general plan for the course; deviations announced to the class by the instructor may be necessary.

Course Description

This hands-on course covers the basics of genome analysis from a microbial ecologist’s perspective. Course participants take part in a group annotation project of marine genomic or metagenomic data, focusing on pathways of ecological and biogeochemical interest.

Class meetings include short lectures, bioinformatic exercises, discussions of recent literature, and hands-on gene analysis. Each participant will be responsible for a component of the annotation project and may have an opportunity to contribute to a publication based on the class project. Exact topics to be covered in lecture and lab will evolve during the semester based on the needs of the students and direction of the group project.

Course Outline – MARS8180 – Marine Ecological Genomics – Fall 2012

Date	Topics	Readings
Aug 14	Lecture/Discussion: Course introduction, course web page, Roseobacter genomes Lab: BLAST searches at NCBI	Newton et al. 2010
Aug 15	Lecture/Discussion: Roseobacter ecology; HTCC2255 genomes; genome browser Lab: Roseobase; set up logins at CAMERA, RAST, and IMG	Buchan et al. 2005; Wagner-Döbler and Biebl 2006
Aug 21	Lecture/Discussion: Orthologs vs. Homologs vs. Paralogs Lab: Identifying orthologs	Moran 2008, pp. 91-101; Koonin 2009
Aug 23	Lecture/Discussion: Building Trees 1 Lab: Sequence alignment	Hall, 2007 excerpt
Aug 28	Lecture/Discussion: Building Trees 2 Lab: Tree-building programs	No readings
Sept 4	Lecture/Discussion: Building Trees 3 Lab: Tree-building programs	Hall, 2007 excerpt
Sept 6	Lecture/Discussion: Potential project presentations Lab: N/A	Moran et al. 2004; Swingley et al. 2007
Sept 11	Lecture/Discussion: Proteins and protein databases; Pfam; HMMs; COGs Lab: TBD	TBD
Sept 13	Lecture/Discussion: Pathway mapping; KEGG; MetaCyc Lab: TBD	TBD
Sept 18	Lecture/Discussion: Comparative genomics: IMG and SEED Lab: TBD	TBD
Sept 20	Lecture/Discussion: Sequencing methods; Phred/Phrap; Lab: TBD	TBD
Sept 25	Lecture/Discussion: Promoters and Ribosome Binding Sites; finding ORFs Lab: ORF finding exercise	TBD
Sept 27	Lecture/Discussion: Environmental genomics (BACs/Fosmids and 454) Lab: CAMERA	TBD
Oct 2	Lecture/Discussion: Environmental genomics (whole genome shotgun) Lab:	TBD
Oct 4	No formal class meeting	
Oct 9	Lecture/Discussion: Phage genes	TBD
Oct 11	Lecture/Discussion: Preliminary project presentations Lab:	TBD
Oct 16	Lecture/Discussion: Preliminary project presentations	TBD

	Lab:	
Oct 18		TBD
Oct 23	No formal class meeting	
Oct 25		TBD
Oct 30		TBD
Nov 1		TBD
Nov 6		TBD
Nov 8		
Nov 13		
Nov 15		TBD
Nov 20	<i>UGA not in session</i>	TBD
Nov 22	<i>UGA not in session</i>	TBD
Nov 27	Final project presentations	<i>Class stays late?</i>
Nov 29	Final project presentations	<i>Class stays late?</i>