

## Quantitative Methods in Microbial Oceanography

Farooq Azam; SIOB 278; WI18; 2 credit units; 1 meeting per week

### **Syllabus**

Microbes play major roles in structuring the marine ecosystems and in ocean response of climate change. This course will discuss the state of the art in quantitative methods for microbial abundance, biomass, phylogenetic composition and food web and biogeochemical activity. This student seminar course will combine critical analysis of the relevant literature and some lab exposure (epifluorescence, confocal laser and atomic force microscopy; radiotracer and fluorescence based bulk and single cell activity measurements; flow cytometry).

- 1) Conceptual context (Azam)
- 2) Bacteria and Archaea: Enumeration and biomass
- 3) Virus enumeration
- 4) Protists: enumeration and biomass
- 5) Phylogenetic analysis
- 6) Bacterial *in situ* biomass and carbon production
- 7) Individual cell growth rate methods in seawater microenvironments
- 8) Protistan grazing on bacteria
- 9) Virus mortality of bacteria
- 10) Bacteria- bacteria antagonism/lysis: *in situ* rates