ECODIM IV

ECOLOGY & DIVERSITY OF MARINE MICROORGANISMS

Course schedule January 2 - 21, 2006

Week 1 January 2-7	Morning	Afternoon	Evening
Sunday January 1		Afternoon - evening Students and TAs arrive at the Cabañas El Mirador (Monica Sorondo, course coordinator, phone ++56 41 203585)	
Monday January 2	08.30 **Welcome** Silvio Pantoja, Director PG Program 08.40 **Presentation of participants** 09.00 **Course organization** Introduction to the course goals and overview of course program (Osvaldo Ulloa) 09.30 Introductory Lectures L 1 & 2 **Marine microbial ecology: what we know, what we don't yet know** (Kurt Hanselmann)	14.00 **Laboratory facilities and equipment** **I**ntroduction to experimental possibilities and suggestions for investigations in small groups A, B, C (Osvaldo Ulloa, Juan Francisco Santibañez, Rodrigo De la Iglesia) 16.00 Individual study time, preparation of evening presentations	19.00 – 21.00 **Student presentations, Group A** Heather Jenny Juan Jennyfer Alexandra
Tuesday January 3	08.30 L 3 **Chemical basics and methodologies for the study of eco-metabolic processes** (Kurt Hanselmann) 10.30 L 4 **Oceanographic conditions of the continental shelf environment** (Osvaldo Ulloa)	14.00 Defining **Individual Projects** Begin lab work (Osvaldo Ulloa, lab instructors). Preparation of equipment for sampling cruise (Juan Francisco Santibañez) and lab equipment (Rodrigo De la Iglesia)	19.00 – 21.00 **Student presentations, Group B** Martha Marcelo Ivan Giselle Avy
Wednesday January 4	08.00 **Group 1** San Jorge II departs from Dichato harbor for sampling (sediment cores) in Coliumo Bay. Partial sample preparation on board the boat. 08.30 **Group 3** Sampling of biofilm communities in Coliumo harbor. Preparation for sample processing and introduction to OLAT.	14.00 **Group 2** San Jorge II departs from Dichato harbor for sampling (water column) in Coliumo Bay. Partial sample preparation on board the boat.	Lab after return: Work-up samples for **individual projects:** Filtration of water samples for flow cytometry, concentration and fixation for DNA amplification, squeezing of sediment cores, cleaning Thioploca and

			/or Beggiatoa from macrofauna, Dilution for enrichments culture. Assay labile interstitial water components (H_2S) and fix others for assaying them later
Thursday January 5	08.30 L 5 **Phylogenetics - evolutionary approaches to microbial diversity** (Kurt Hanselmann) 10.30 L 6 **Applications of flow cytometry to water column microbial communities** (Osvaldo Ulloa)	14.00 **Project work in groups** Sample storage, microscopy, sample processing (DNA extraction, PCR, Gel electrophoresis (Osvaldo Ulloa, and lab instructors)	19.00 – 21.00 **Student presentations, Group C** Carlos Lucy Edgardo Constanza Gerdhard
Friday January 6	08.30 L 7 **A biogeochemical systems approach to marine microbial ecology** (Kurt Hanselmann) 10.30 L 8 **Microbially mediated coupling of iron, manganese and phosphate cycling** (Kurt Hanselmann)	14.00 **Project work** Continue assaying interstitial water components and carry out other chemical analyses. Preparations for DNA extraction, PCR, gel electrophoresis, microscopy, staining, enrichments	18.00 **Reception** offered by the Department of Oceanography of UdeC's Austral Summer Institute and the Interntational Graduate Course Series in Oceanography
Saturday January 7	08.30 L 9 **Biogeochemistry and photosynthethesis in the oxygen mininum zone** (Osvaldo Ulloa) 10.30 L 10 **New large bacteria below the oxygen minimum zone of the Eastern South Pacific: Is it a Precambrian relict community?** (Victor Ariel Gallardo)	14.00 **Project work** continued 18.00 Define and chose **exam paper** (internet, library and literature searches)	19.00 Summary of achievements, week 1
Sunday January 8	Free day		

Week 2 January 9-14			
Monday January 9	08.30 L 11 **Earth history and what makes a marine microbe** (Edward DeLong) 10.30 L 12 **Introduction to the microbial loop and marine microbial diversity** (Edward DeLong)	14.00 **Project work** continued Flow cytometry, DNA extraction, PCR, Gel electrophoresis, Microscopy, Staining, Enrichments	19.00 **Project work** continued and **individual study time**
Tuesday January 10	08.30 L 13 **Diversity and distribution of bacteria in the ocean** (Edward DeLong) 10.30 L 14 **Microbiology of anammox and its role in geochemical cycling and in waste water treatment** (Gijs Kuenen)	14.00 **Project work** continued, and demonstration workshops	19.00 Group A **Computer lab**: Bio-geo-chemical thermodynamics (Kurt Hanselmann) Group B **Computer lab**: Bio-Informatics (Rodrigo De la Iglesia) Group C **Individual study time**
Wednesday January 11	08.30 L 15 **Planktonic Archaea** (Edward DeLong) 10.30 L 16 **Ecological, biochemical and genetic aspects of harmful photosynthetic microorganisms** (Mónica Vásquez)	14.00 **Project work** continued, and demonstration workshops	19.00 Group A **Computer lab**: Bio-Informatics (Rodrigo De la Iglesia) Group B **Individual study time** Group C **Computer lab**: Bio-geo-chemical thermodynamics (Kurt Hanselmann)
Thursday January 12	08.30 L 17 **Microbial communities from polluted ecosystems: Culture-independent approaches applied to microbial ecology** (Bernardo Gonzáles) 10.30 L 18 **Biosynthetic pathways of algal toxins, what do we know?** (Mónica Vásquez)	14.00 **Project work** continued, and demonstration workshops	19.00 Group A **Individual study time** Group B **Computer lab**: Bio-geo-chemical thermodynamics (Kurt Hanselmann) Group C **Computer lab**: Bio-Informatics (Rodrigo De la Iglesia)

Friday January 13	08.00 Bus leaves Dichato for Concepción 10.00 - 18.00 **Minisymposium** in Concepción: **Current Aspects of Marine Microbial Ecology** (special program) Sandwiches for lunch and drinks at the symposium site 18.30 Bus leaves for Dichato		19.30 Reception with course students, symposium speakers and guests at Dichato 23.30 Bus leaves with guests for Concepción
Saturday January 14	09.30 L 19 **Microbial communities in an intertidal rocky ecosystem exposed to copper** (Bernardo Gonzáles) 11.00 L 20 a) **Introduction to the nitrogen cycle in the ocean and the main motivations for studying it** b) **Autotrophic processes: Nitrification and anammox** (Laura Farías)	14.00 **Project work** continued, and demonstration workshops with Laura Farías	19.00 Turn in chosen **exam paper** 20.00 Summary of achievements, week 2
Sunday January 15	Free day National Presidental Elections		

Week 3 January 16-21			
Monday January 16	08.30 L 21 **Phytoplankton : Basic concepts. Tools and Techniques** (Daniel Vaulot) 10.30 L 22 a) **Heterotrophic processes: denitrification and nitrate-ammonification** b) **Advances on understanding the N-cycle in the oxygen minimum zone of the eastern South Pacific** (Laura Farías)	14.00 **Project work** with Laura Farías	19.00 **Introduction to r-DNA sequence analyses and probe design using ARB** (Daniel Vaulot)
Tuesday January 17	08.30 L 23 **Phytoplankton : Taxonomy. Major groups of micro-phytoplankton (diatoms, dinoflagellates, prymensiophytes)** (Daniel Vaulot) 10.30 L 24 **Photosynthesis, picoplankton and genomes** (Eric Webb)	14.00 **Project work** continued	19.00 Group A **Individual study time** Group B **Analysis of sequences, design and validation of probes using ARB** (Daniel Vaulot)
Wednesday January 18	08.30 L 25 **Picoplankton : Discovery. Major groups of eukaryotic picoplankton** (Daniel Vaulot) 10.30 L 26 **Nitrogen fixation, ecology and growth limitation of oceanic diazotrophs** (Eric Webb)	14.00 **Project work** continued	19.00 Group A **Individual study time** Group B **Analysis of sequences, design and validation of probes using ARB** (Daniel Vaulot)
Thursday January 19	08.30 L 27 **Energetics and genomics of marine heterotrophs in the microbial loop** (Eric Webb) 10.30 L 28 **Picoplankton : Diversity from molecular approaches. Ecology** (Daniel Vaulot)	14.00 **Finish up project work**	All groups: **Summarize project work**, design poster

Friday January 20	08.30 **Course research results**: Summary of project work and integration of results into project posters Design final versions of course project posters	**Preparations for exam and for paper presentation**	**Preparations for exam and for paper presentation**
Saturday January 21	08.30 See Special Program **Course exam part 1** Student exam and paper presentations, max. 25 minutes per student, discussion included (course participants, staff and guests)	14.00 **Course exam part 2** Student exam and paper presentations, max. 25 minutes per student, discussion included (course participants and staff). Special program. 17.30 **Course graduation at Dichato** Course participants, Faculty and invited Guests, Course Certificates	18.00 Course evaluation, achievements, ideas for future courses Thank-you to campus and course staff 18.30 **Reception** and **Fare well party**
Sunday January 22	End of Course. Pack equipment for transport back to main campus and clean Dichato labs and your files on the computers. Departure		Course directors: Reporting